NETWORK WORLD

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Businesses get schooled in 'culture' of the Internet

First in a series of occasional articles about doing business on the Internet.

BY ADAM GAFFIN

Farmer Grant is getting a fair number of visitors to his flower stand off the information highway.

Larry Grant, whose family runs a 100-acre farm, a flower shop and a farm stand in Ann Arbor, Mich., has had a flower catalog on the Internet since around Valentine's Day. Users can see color pictures of bouquets and place orders on-line. Grant says he's received orders from all over the U.S., as well as from Canada and Japan.

Grant's company is just one of a growing number of companies doing business over the Internet. From small publishing houses to multinational corporations, businesses are turning to the Internet to win new customers, support existing buyers, and collaborate with suppliers and business partners.

But companies have to move carefully — and not just for technical and security reasons.

The Internet is a community unto itself, representing millions of people with their own lingo and a unique set of cultural norms.

Companies that ignore this do so at their own peril.

See **Internet culture**, *page 62*

Inside

- One company learns the hard way how not to do business over the Internet.
- Ameritech gets set to enter the Internet access market and offer IP transport service.
- Automakers are mulling the Internet as a means for communicating with suppliers and dealers.

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Critics assail plan to end Fed's OSI policy

BY ELLEN MESSMER

Washington, D.C.

A proposal to drop the federal government's OSI-only procurement policy has become the focus of intense debate among network planners worldwide.

The U.S. aerospace industry, as well as several manufacturers and foreign governments, said the Federal Information Resource Management Panel's (FIRMP) draft report suggesting the government drop its 3-year-old commitment to Open Systems Interconnection would disrupt long-term efforts to build interoperability through OSI.



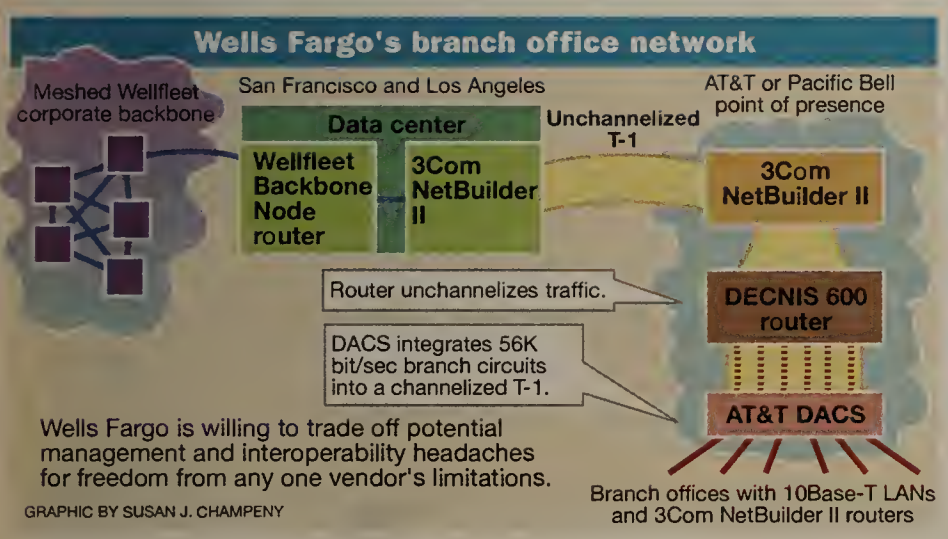
Gen. Emmet Paige Jr., assistant secretary of defense, supports a plan to let "affinity groups" set their own interoperability rules.

"Scrapping the enormous OSI investment in favor of public specifications, i.e., the ancient Internet Protocol suite, demonstrates a naivete in understanding the complexity of our modern world," Boeing Information Services, Inc. stated in comments filed with the National Institute of Standards and Technology (NIST).

The FIRMP panel, headed by Diane Fountaine, telecommunications director at the Department of Defense, was formed last year at the request of federal technology chiefs frustrated with trying to cobble together OSI networks while TCP/IP swept the marketplace.

The panel's final report is due out this April, and it may have a strong impact on the

See **OSI**, *page 63*



GRAPHIC BY SUSAN J. CHAMPENY

Bank tests router mix

BY JOANIE WEXLER

San Francisco

Wells Fargo Bank, N.A. is putting router vendors' interoperability claims to the ultimate test.

For two years, the company has run a Wellfleet Communications, Inc. backbone linking its headquarters buildings here and data centers here and in Los Angeles. It is now installing 3Com Corp. NetBuilder II routers at 700 branch offices throughout California along with Digital Equipment Corp. DECNIS 600s in 10 carrier hub sites.

The move is part of a project to migrate the bank's branches from an IBM terminal-to-host network to a distributed, client/server setup based on 10Base-T local-area networks, said Mike Russo, vice president of network systems engineering.

The multivendor strategy lets Wells Fargo overcome limitations of doing business with a single vendor and helps meet varying protocol support and price/performance requirements in different parts of the net, Russo said.

See **Wells Fargo**, *page 63*

NEWSPAPER

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Digital plans new DECnet, SNA options

BY JIM DUFFY

Maynard, Mass.

Digital Equipment Corp. will soon expand its networking portfolio with new DECnet/OSI and IBM SNA tools, and ship a new router the company claims can cut remote connectivity costs in half.

Digital is expected to announce in May a new version of DECnet/OSI for OpenVMS VAX 6.0 and 6.1. DECnet/OSI Version 5.7 will integrate DECnet and Open Systems Interconnection protocol stacks and allow OpenVMS VAX 6.0 and 6.1 systems to participate as end nodes in DECnet/OSI nets.

Other features of DECnet/OSI 5.7 include OSI addressing and management utilities. The OSI addressing utility supports 160-bit addresses, enabling users to build DECnet networks of virtually unlimited size.

The management facilities include Network Control Language, a CMIP-based management language that allows managers to set net parameters as well as start and shut down network components from a central management console.

Users have been asking for DECnet/OSI support on OpenVMS 6.0.

"Everybody's been wanting it," said Dennis Jensen, associate computer scientist at the Institute for Physical Research and Technology at Iowa

See **Digital**, *page 63*

INTERNETWORKING

Technology deal pays off for remote sites

BY MICHAEL COONEY

Dallas

LanOptics, Inc. and Cisco Systems, Inc. will announce by April the offspring of their technological marriage — powerful but inexpensive hub/router products for remote branch offices.

The BranchCard offerings include an integrated hub/router card and token-ring and Ethernet hub cards that will tie remote servers to corporate Systems Network Architecture or TCP/IP backbones.

BranchCard could ease remote site networking by reducing the number of devices required and simplifying management. The server-based systems will be manageable from IBM's host-based NetView or a Simple Network Management Protocol manager.

> *"We like to keep our branch office nets simple, and the products seem to do that."*
>
> -Graham Morrison, Blue Cross/Blue Shield of Connecticut

"High costs and poor network management capabilities have kept many users from tying in their remote offices, but the BranchCards will address those problems," said Ed Grace, president of LanOptics, which announced its partnership with Cisco at the INTEROP 93 show in Paris last fall.

The BranchCard hub/router card will combine LanOptics hub technology with a Cisco 2500 router on a board that will fit in any Intel Corp.-based personal computer. Grace said the firm is working on a similar board for

See **BranchCard**, *page 8*

Briefs

Heading into BrainShare '94. Novell, Inc. will deliver on promises next week at its annual BrainShare '94 developers' conference, including the formal unveiling of the multiprocesing strategy it has been hinting at for some time (*NW,* Feb. 14). The company is expected to release a time frame for when it will provide clustering technology to NetWare environments, which will let NetWare use idle processors on different machines to improve performance. Novell is also expected to release the first software development kits for the Telephony Services API and the first Telephony NetWare Loadable Modules, both developed in conjunction with AT&T (*NW,* Oct. 4, 1993, page 3).

In addition, Novell's AppWare Systems Group will unveil a joint development, marketing and distribution agreement with PowerSoft Corp. and will discuss other partners that have entered into the AppWare Partners program.

Rolm pulls a fast one. At the Hannover Fair CeBIT show in Hannover, Germany, last week, Rolm parent Siemens Private Communications Systems demonstrated an Asynchronous Transfer Mode (ATM) switch prototype it intends to one day sell to customers as a front end to its Rolm 9751 private branch exchange. While the company billed the demo as the "world's first demonstration of ATM switching in a PBX environment," no PBX was in sight; the setup included only data and video from 486-based personal computer systems.

Tony Tissot, group manager of systems marketing at Rolm, would not say when the PBX ATM interface would emerge or when the switch — dubbed the ATM-P — would become an actual product for sale.

Harsh words from Gerstner. IBM Chairman and Chief Executive Officer Louis Gerstner said in a letter to shareholders last week that 1993 was the worst year in the company's history. "We have been too bureaucratic and too preoccupied with our own view of the world," Gerstner wrote. "We have been way too slow getting new things to the market...time and again someone else beat us to the marketplace." In 1993, IBM took its largest write-offs ever — $8.9 billion — and ended the year with a net loss of $8 billion on revenue of $62.7 billion. Revenue was off 3%.

Backing up Cheyenne. In reaction to recent stories concerning Cheyenne, Inc. ARCserve LAN backup software (*NW,* March 7, page 1), competitors have been quick to offer ARCserve users an alternative. Rexon, Inc. of Simi Valley, Calif., is expected to release this week a new data storage system for NetWare environments called ProServe CX, which has the ability to read backup tapes created under ARCserve.

And for 90 days, Systems Enhancement Corp. of St. Louis will allow Cheyenne users to trade in ARCserve 4.0 or 5.01 software for a $95, 1,000-user license for its Total Network Recall data backup and restore software.

Rexon: (800) 422-2587; Systems Enhancement: (314) 997-7717.

Digital continues Phase IV phaseout. In keeping with its plan to offer only a DECnet/OSI stack with future versions of the OpenVMS operating system, Digital Equipment Corp. will end shipments of packet switching and synchronous wide-area network device driver software for DECnet Phase IV in May.

Final orders will be taken May 6 for Version 4.3 of Digital's VAX PSI and VAX PSI Access X.25 software, and Version 1.2 of its WAN Device Driver. The last shipment date is May 30. The products, which work with OpenVMS VAX Version 5.5-2, will be supported until April 1995.

Contacts

ADDRESS: Network World, 161 Worcester Rd., Framingham, MA 01701. PHONE: (508) 875-6400; FAX: (508) 820-3467; INTERNET: network@world.std.com.; BBS: Interact with other readers: download free software, submit letters to the editor, leave news tips, change of address requests or hunt for jobs by using your IBM, Apple or other computer to dial into the BBS at speeds up to 9.6K bit/sec by dialing (508) 620-1178 or (508) 620-1160. READER ADVOCACY FORCE (R.A.F.) HOTLINE: Contact us with story tips about pressing user issues, (800) 622-1108, Ext. 487; NETWORK HELP DESK: Contact Dana Thorat via any of the above means.

Network HELP desk

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-3467, via the Internet at djt@world.std.com or via CompuServe at 73244,2673.*

I was told that the Help utility is missing from Novell, Inc.'s NetWare 3.12. Is that correct?

Gary Flynn, Harrisonburg, Va.

Ronald Nutter, director of technical services at 900 Support, a 24-hour, seven-day-per-week NetWare technical support company in Lake Oswego, Ore., replies:

That is correct. The Help utility for NetWare 3.12 and 4.01 was replaced with a Windows-based help utility called Electrotext, which contains the text of all NetWare 3.12 or 4.01 systems administration manuals. It also allows you to do key word searches on topics with which you need help.

Electrotext is supplied with only the CD versions of NetWare 3.12 and 4.01 and would probably have been installed during the NetWare installation process. To find out if Electrotext was installed, you can check the SYS:PUBLIC directory on the server for a file call ET.EXE. For users to run Electrotext, the ET.INI file must be copied to their local workstations. Instructions for running Electrotext can be found on the reference cards supplied with NetWare.

If you do not have Electrotext, it is available on the Internet via File Transfer Protocol by typing ftp.novell.com.

Is there a way for Macintoshes and PCs to exchange files on their hard drives?

Colin Dunn, Boulder, Colo.

Carl Reid, computer systems analyst and director of NetTECH SYSTEMS, a Jersey City, N.J.-based computer consulting company, replies:

You might want to check out Farallon Computing, Inc.'s Timbuktu product line as one possible solution. Timbuktu communications software allows Macintosh and PC users to transfer files, share screens, remotely control Macintoshes and PCs, and share printers and file serv-

See **Help desk,** *page 36*

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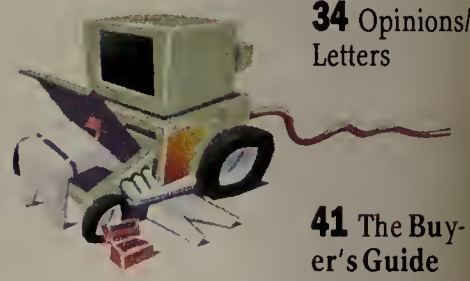
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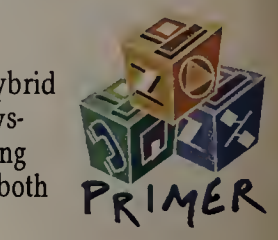
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Noted for improving TCP/IP performance, Van Jacobson quietly keeps on innovating.

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Users struggle to manage their distributed databases

BY PETER LISKER

Although they may be sold on the concept of distributed networking, most users are still struggling with the problem of managing the databases now cropping up throughout their networks.

Among the issues they face are a lack of standardized database management tools, debates over who should take management responsibility, and whether to manage databases locally or from a central site.

There may be help on the way, such as from a recently established working group that is devising a Simple Network Management Protocol-based specification for databases (*NW,* Feb. 7, 1994, page 4) and the IBM Mercury product, designed to provide management capabilities for heterogeneous database environments (*NW,* March 14, page 11). But users need help today.

Database mgmt. support scorecard

Database vendor	Mercury (an IBM and LEGENT technology)	SNMP
Oracle	Yes	Yes
Informix	Yes	Yes
The ASK Group (Ingres)	Yes	Yes
Sybase	No	Yes

"At this point, it's still difficult for us to gather performance information, monitor disk storage utilization and obtain transaction rate information within our database systems," said Jon Engelage, a staff physicist at Lawrene Berkeley Laboratory in California, who administers a complex of heterogeneous minicomputer database systems.

Other users echo his concerns.

"We're proceeding with the deployment of distributed databases systems very cautiously," said Jim White, vice president of architecture for San Francisco-based brokerage firm Charles Schwab & Company, Inc. "While the lack of standardized management tools isn't the only reason for our measured pace, it's certainly one of the primary reasons."

The proprietary nature of most database management tools is similar to the state of network management in general a few years ago.

Users employed multiple vendor-specific management tools that had little ability to communicate with one another and effectively correlate data to diagnose problems.

Similarly, most companies employ management tools offered by various database vendors that are basically proprietary in nature. As a result, an organization with databases from different vendors must not only have management or administrative personnel dedicated to each system, but also must maintain separate management stations for each, as well.

"We've found that even for tasks that should be comparatively simple, like checking the status of multiple databases across the network, we're forced to use multiple management tools," said Rolen Yoshinaga, director of information technology for the Utah Administrative Office of Courts in Salt Lake City.

And while traditional network management structures call for specially trained personnel to manage the physical network resources, bringing databases into the equation means a significant change.

"Unfortunately, the skills required to manage distributed databases are completely unknown to network management people," said Richard Finkelstein, president of the Chicago-based consulting firm Performance Computing, Inc. "Database administration is a different ball game from what network people are familiar with, and this raises big issues as to how you create a management structure to deal with the diverse skill-sets required."

Organizational constraints can compound the problem, according to Charles Schwab's White.

"There's very little coordination between our network management personnel and our database groups, mostly due to the fact that the personnel don't even report to the same people," he said.

Shaku Atre, president of Port Chester, N.Y.-based Atre and Associates, said White's situation is not uncommon. "Most companies have already distributed their data and are now having to reverse-engineer a management structure to effectively administer the databases that exist throughout the company," she said.

Another issue is deciding from where to manage the databases. The traditional central-site net management paradigm may not be appropriate when databases are involved.

"The reality is that the real knowledge of the individual databases resides at the local level and to duplicate that knowledge at a centralized location will probably be prohibitively expensive and impractical," said Carmen Hernandez, project manager at the Department of Information Resources for the state of Texas. "So far, we've decided to let remote sites assume management for the individual databases and try for a central management scheme for the consolidated database."

Until there are standards-based implementations of database management tools, however, central-site control may be unattainable.

"We need to be able to monitor availability, check machine utilization, control backup and recovery, as well as [do] more traditional administrative tasks, like adding users," said Dave Leahannah, MIS director for Milwaukee-based DCI Marketing, Inc. "Because of a lack of good tools, we're often forced to have local people at the remote sites perform many of these tasks, which means I'm effectively turning over control of an important corporate asset."

With all the pitfalls and shortcomings of current database management systems, Atre likens the situation to crisis management and urges users to explore the options for preserving valuable corporate data.

Dos and don'ts for managing distributed databases

Dos

1. Investigate whether central or distributed management best fits your needs.
2. Identify mission-critical databases that should be replicated to other sites.
3. Set up procedures for emergency on-site management at distributed sites.
4. Cross-train network and database management personnel.

Don'ts

1. Assume all your databases can be managed simultaneously from a central site.
2. Overlook the challenges involved with distributing databases from multiple vendors.
3. Expect network managers to have end-to-end management responsibility of the database environment.
4. Discount the value of having hot-site backups for your critical databases.

Comments?

See "Contacts" box on page 2.

The Superhubs

Company	Cabletron	Chipcom Corp.	SynOptics	Hughes
Product	MMAC-Plus	ONcore	LattisSystem 5000	Enterprise Hub
Backplane capacity	10G bit/sec	13G bit/sec	12G bit/sec	2G bit/sec, expandable to 10G bit/sec
Slots	14	17	14	14
Segments supported	168	100	52	115
Maximum ports	500	200	240	336
Topologies	Ethernet, token ring, FDDI, ATM	Ethernet, token ring, FDDI, ATM	Ethernet, token ring, FDDI, ATM	Ethernet, token ring, FDDI, ATM
Routing	Yes	No	Statement of direction	Yes
Management	Spectrum for Open Systems	ON demand Network Control	Optivity	20/20 for Windows/Unix

Hughes LAN Systems bundles router in hub

BY SKIP MACASKILL

Mountain View, Calif.

Hughes LAN Systems, Inc. this week is expected to offer the first routing products for its intelligent hub line.

The fruit of a joint marketing and development deal signed in December with Wellfleet Communications, Inc., Hughes' routing modules support Ethernet, token-ring, Fiber Distributed Data Interface and Asynchronous Transfer Mode (ATM) nets. They complement the homegrown bridging capabilities already offered in the Enterprise Hub.

"The integration efforts by other hub and router vendors have been marginal at best, but we've invested a lot of time and effort into this relationship to ensure that the routing is tightly integrated," said Bobbi Murphy, vice president of marketing at Hughes. " This puts the Enterprise Hub into the superhub class of next-generation rollouts from Cabletron [Systems, Inc.] and SynOptics [Communications, Inc.]."

"The integration efforts by other hub and router vendors have been marginal at best."

SynOptics and Cisco Systems, Inc. attempted to achieve this type of tightly integrated routing and hubbing solution but abandoned the joint development after about 18 months, citing lack of user demand and the inability to coordinate feature upgrades.

"Cisco and SynOptics got caught in clashing personalities, a struggle over who would control the relationship and an uneasy feeling of future competition," said Charlie Robbins, director of communications research at Aberdeen Group, Inc., a Boston consultancy. "Hughes and Wellfleet might be able to make this work because they are concentrating on leveraging each other's technology and not controlling issues."

The routing line includes an Ethernet Router Module that provides three local-area network connections to the three Ethernet backplane segments supported by the hub. There is also a token-ring version that connects to the three rings supported by the hub.

The access modules are daughter boards that are housed on the router modules and provide access to other network types. They come in Ethernet, token-ring, FDDI, ATM and wide-area network flavors.

The Ethernet and token-ring routing modules are based on Wellfleet's Feeder Node router technology and are powered by a Motorola, Inc. 68030 processor. They support the Internet Protocol, Novell, Inc. Internetwork Packet Exchange (IPX), DECnet Phase IV, AppleTalk, Xerox Corp. Xerox Network Systems, Banyan Systems, Inc. VINES and Open Systems Interconnection net protocols.

It also supports the Routing Information Protocol and Open Shortest Path First routing protocols, as well as Transparent Bridging and source route bridging.

The WAN access module will handle the Point-to-Point Protocol, frame relay, X.25 and Switched Multimegabit Data Service protocols via a variety of physical interfaces, such as RS-232, RS-422, V.35 and X.21, at speeds up to 2M bit/sec.

The ATM Router Access Module will let users aggregate LAN traffic onto the Enterprise Hub's 2G bit/sec ATM backplane, which can be connected to an ATM switch or public network via a 155M bit/sec interface. Each routing module contains an embedded Simple Network Management Protocol agent and a dedicated management processor. The modules also include a Hub Administration Bus that provides supplemental information for problem diagnosis and resolution.

"By embracing a distributed routing scheme, Hughes and Wellfleet are heading in the right direction," Robbins said.

"By distributing functionality such as routing, users can reduce the traffic on the backbone and make their enterprise nets run more efficiently."

The new Hughes routing modules will be available in the third quarter. The base Ethernet and token-ring modules cost $7,495 and $8,995, respectively. The Ethernet, FDDI and WAN access modules cost $1,495, $9,995 and $1,195, respectively, and the ATM Router Access Module goes for $6,495.

Hughes: (415) 966-7300.

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When it comes to high-performance hubs, the new DEChub™ 900 MultiSwitch is a whole different animal. It's the most flexible and cost-effective hub around. For starters, its technology-independent backplane supports Ethernet, Token Ring or FDDI in any slot — up to eighteen separate LAN segments. Over 3GB of throughput gives you all the bandwidth you'll ever need. It's ATM-ready today. All DEChub 900 modules and the award-winning DEChub 90 modules work as single units or snapped into the DEChub 900 backplane.



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HP melds monitoring apps with OpenView

BY JIM DUFFY

Palo Alto, Calif.

Hewlett-Packard Co. last week unveiled a suite of performance monitoring and troubleshooting applications that enable end-to-end management of distributed LAN internets from an HP OpenView or SunConnect SunNet Manager console.

The HP NetMetrix 4.0 suite melds the capabilities of HP's OpenView Probe Manager and Metrix Network Systems, Inc.'s local-area network segment monitoring applications. Probe Manager allows OpenView operators to collect data from HP's LanProbe Ethernet and token-ring LAN monitors.

HP acquired Metrix last May.

"The NetMetrix line is a set of high-quality applications," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo. "HP's finally getting some decent probe management on OpenView. The basic integration is pretty solid. They're delivering a lot of value."

NetMetrix 4.0 includes six operations and fault management, and network planning applications including enterprise utilities, internetwork monitor, load monitor, protocol analyzer, network file server monitor and traffic generator.

Enterprise utilities allow users to consolidate and present information from multiple LAN segments, configure alarm thresholds, perform baseline measurements and long-term performance reporting. The internetwork monitor application presents data by network segment, media access control address and network layer views to help network managers plan bandwidth capacity.

Features of HP's NetMetrix 4.0

- 6 applications for operations/fault management and network planning.
- Integration with HP OpenView and SunNet Manager.
- Works with HP LanProbe segment monitors and data collection agents.
- Provides monitoring and analysis of distributed LANs from a Motif graphical user interface.

The load monitor lets users monitor traffic on a single network segment in real time or over periods of time to identify performance bottlenecks. It includes a "zoom" feature that correlates network load by time, sources, destination, protocol and packet size.

The protocol analyzer decodes more than 100 protocols. It also lets a user sift through packets before or after trace files are captured to buffer memory to determine events that may have led to a fault.

The net file server monitor, meanwhile, lets managers evaluate server traffic loads and response times, and monitors connection request retransmits, rejections and errors.

The application also lets a manager correlate any combination of these measurements over time or at a specific time.

The traffic generator lets users generate a traffic profile to simulate a load on the network or to test network devices. This information can be used to determine the impact of adding nodes to the network.

The applications work with data collected by HP's LanProbe segment monitors or by agents resident on HP and Sun Microsystems, Inc. workstations attached to the managed segment.

"I've been working with the LanProbes since day one, and I've been waiting with bated breath for this version [of NetMetrix]," said Frank Belland, senior communications consultant at Martin Marietta Corp. "Under OpenView, you have to singly address every probe and talk to it. If you have a large network and many probes out there, you don't want to have to go out and talk to every one of them."

McConnell said HP's NetMetrix line will go up against IBM's RMON/6000 monitoring application for NetView/6000 and AT&T Global Information Systems' StarSentry platform running ProTools, Inc.'s LAN monitoring applications.

NetMetrix 4.0 supports the Simple Network Management Protocol and the SNMP Remote Monitoring Management Information Base. The application suite costs $12,475 and is available now.

✆HP: (415) 857-1501.

IBM rolls out new and improved LAN products

BY CHRISTINE BURNS

Research Triangle Park, N.C.

IBM last week unveiled several new local network products designed to give enterprise network users more connectivity and management options.

At the top of the rollout list is IBM's new EtherStreamer full-duplex switch, which has eight full-duplex switching ports. Full-duplex operation enables the device to support 20M bit/sec links when communicating with other EtherStreamer switches or IBM's full-duplex EtherStreamer personal computer interfaces.

The EtherStreamer adapter line was announced last July and is available for PCs based on IBM's 32-bit Micro Channel Architecture bus. When IBM first released the EtherStreamer line, it did not offer any full-duplex switches, so officials recommended using equipment from vendors such as Kalpana, Inc. or Standard Microsystems Corp.

"Now we have all the pieces to allow a customer to support full-duplex technology," said Laura Knapp, senior technical advisor of IBM networking systems. IBM partnered with Kalpana to gain the full-duplex technology for use in the EtherStreamer line.

"It's good to see that IBM has partnered with a strong player in this emerging market rather than build the switch from the ground up," said Joe Mohen, chief technical officer with Proginet Corp., a software developer in Uniondale, N.Y. "When IBM goes it alone with an emerging technology that wasn't its brainchild, a good product doesn't always result."

REMOTE NETWORKING

Trio of vendors offers up branch office tools

BY MICHAEL COONEY

Northern Telecom, Inc. (NTI), Hypercom, Inc. and Sync Research last week all rolled out new products designed to more efficiently tie branch offices to the corporate backbone.

NTI announced a new, low-end member of its Magellan switch family, while Hypercom and Sync Research targeted the Systems Network Architecture market with products that offer direct frame relay links to IBM front-end processors (FEP).

The Magellan Access Switch is positioned as a feeder node in NTI's Magellan line, which includes the recently released Passport Asynchronous Transfer Mode (ATM) cell switch (*NW*, Feb. 7, page 15), the DPN-100 packet switch and the carrier-based Concord and Gateway ATM switches.

The four-slot Access Switch can be configured to support a maximum of 32 ports. The ports can support any mix of token-ring or Ethernet local-area nets and asynchronous, Binary Synchronous Communications (BSC) and Synchronous Data Link Control links.

However, only a single port can be configured to support a wide-area leased line, which can handle speeds up to 256K bit/sec. In the forth quarter, the firm will add T-1 frame relay support to the mix.

As expected, the company also announced it will use Cisco Systems, Inc. Ethernet routing technology in the Access and DPN-100 switches (*NW*, Feb. 21, page 1). (The Magellan Passport uses routing technology from Network Systems Corp.

The Access switch will also support a token-ring bridging capability based on NTI's source route bridging technology.

"One of Northern's biggest challenges is letting users know they are even in this market," said Berge Avazian, senior vice president of communications research at The Yankee Group consultancy in Boston. "They have an enterprise view of the network and the products in place to do it."

SNA MEETS FRAME RELAY

Hypercom, meanwhile, added frame relay support to its Integrated Enterprise Network product family, which includes the Router Plus, a box capable of consolidating SNA, LAN and voice traffic onto T-1 lines.

Sync Research rolled out a high-end version of its FrameNode platform, the FN400, a hardware/software device that provides frame relay access for SNA, BSCand LAN devices in branch office nets.

Both products are looking to exploit the latest release of IBM's Network Control Program (NCP) Version 7 Release 1, which supports frame relay access from any device that is RFC 1490-compliant. NCP is the 3745 FEP operating system, and RFC 1490 is the IETF standard that defines how multivendor devices can hook into frame relay/SNA nets.

New on the branch office front

Company	Hypercom	Sync Research
Location	Phoenix	Irvine, Calif.
Product	Frame relay software for Integrated Enterprise Network family	FrameNode FN400
Description	Multifaceted communications box now enhanced to support direct frame relay links to IBM front-end processor.	Provides frame relay access for SNA, bisynchronous and LAN traffic from remote branch offices.
Cost	No charge. Included in all new software releases.	•FN400b for branch offices — $4,000. •FN400c for data centers — $12,000.
Availability	Now	Now

Many users looking to mix SNA and LAN traffic today have moved to a router-based internet employing Transmission Control Protocol/Internet Protocol and TCP/IP encapsulation techniques, said Paul Wickre, president of Hypercom.

"We can now provide SNA over frame relay directly to the FEP on one frame relay [permanent virtual circuit] and non-SNA traffic on another PVC, bypassing the TCP/IP encapsulation schemes and the need for a router in front of the 3745," Wickre said. A corresponding RouterPlus would be needed on the receiving end to support non-SNA traffic, however.

The Router Plus is a multifaceted box that comprises a router, multiplexer, protocol converter, data service unit/channel service unit in one user-customizable unit. It uses a combination of packet switching and time-division multiplexing to handle everything from SNA to LAN traffic (*NW*, Jan. 24, page 16).

It supports up to four T-1 or 56K bit/sec frame relay links.

Sync Research's FN400 supports up to four LAN or BSC interfaces locally and a T-1 speed frame relay link to the mainframe or other Sync Research devices.

The other members of the FrameNode family, the FN100 and FN200, support a single 56K and 128K bit/sec frame relay link, respectively. All three models are RFC 1490-compliant, but the FN100 and FN200 support only SDLC and BSC traffic, not LAN traffic.

Analysts said the Sync Research and Hypercom boxes are aimed at a similar market, but users needing more technological firepower will use the Hypercom box because of its ability to act as a router, switch or frame relay packet assembler/disassembler. The box is aimed at traditional SNA-oriented users.

"They serve a quality role at the edge of the network, feeding information onto the corporate backbone," said Tom Nolle, president of the CIMI Corp. consultancy in Voorhees, N.J. "It is key for users to be able to create networks using frame relay and other lines, as well to get LAN and terminal traffic to the mainframe as easily as possible."

According to users at Blue Cross/Blue Shield in North Haven, Conn., the key to any of the remote connectivity solutions is simplicity. "We just need these boxes to plug and play; otherwise, we don't consider them," said Graham Morrison, project leader for network design at the company.

✆NTI: (919) 992-2788; Hypercom: (602) 866-5399; Sync Research: (714) 588-2070.

Knapp said users can implement the switch to minimize congestion between a high-capacity server and multiple clients on a single LAN segment or to isolate several servers from a LAN segment providing them with a full-duplex data path to the network.

Knapp said IBM will likely produce full-duplex switching modules for its Models 8250 and 8260 hubs.

"The server-only implementation makes sense in most LAN environments because you get the higher throughput at the server where it's needed but it doesn't force you to spend money for full-duplex switching at the workstation level where you don't need it," said Frank Dzubeck, president of Communications Network Architecture in Washington, D.C.

IBM's new LAN offerings

Product	Price	Availability
EtherStreamer switch	$4,800	March 25
AIX Router and Bridge Manager/6000	$6,995	March 25
RouteXpander LNM Support/2	$395	March 25
RouteXpander X.25	$395	March 25
8229 bridge	$3,495	March 25
Frame Relay Bridge/DOS bridge	$1,150	May 27

In addition to addressing performance issues, IBM also released products that make it easier for users to manage interconnected LANs.

The first is the AIX Router and Bridge Manager/6000 application, which runs on the NetView/6000 Version 2 platform and controls the router and bridge functions of the IBM 6611 (*NW*, Feb. 14, page 4). The program provides both individual and total views of up to 100 IBM 6611s, graphically displaying on a single screen the status of 6611 hardware, software, adapters, protocols and traffic rates.

"The server-only implementation makes sense in most LAN environments."

"All of these things could be found out if an administrator wanted to browse the router [Management Information Bases], but that is very difficult and time-consuming unless you're an expert at it," Dzubeck said. Graphic representation makes the whole process much easier, he added.

IBM also increased the manageability of its existing RouteXpander/2 dual port multiprotocol router and bridge product by adding support for the LAN Network Manager (LNM) application.

LNM makes it possible to track characteristics such as how many nodes are connected to the net and the status of individual LAN segments. RouteXpander/2, a board-level product for OS/2-based PCs, can also be managed by LNM. This support comes as an add-on called RouteXpander LNM Support/2.

IBM also announced RouteXpander X.25, which is communications software that makes it possible for RouteXpander to support X.25 links for the first time.

And finally, IBM beefed up its remote bridging capabilities with additions to both its hardware and software bridge families. Knapp said the new 8229 bridge replaces IBM's existing 8209 bridge because the latter was designed for local environments and could not accommodate a remote routing module. The 8229 offers more speed as tests measure its transfer rate as 23,000 packet/sec.

On the software bridging side, IBM has added support to its Frame Relay Bridge/DOS bridge that provides a link between remote token-ring networks using frame relay networks. Previously, the product could only bridge local LANs via frame relay.

✆IBM: (800) 426-2255.

OURS looks for help in meeting task force goals

BY SKIP MACASKILL

Bellevue, Wash.

The message came through loud and clear last week from the Open User Recommended Solutions (OURS) group: We need help.

At its annual spring conference, OURS released four task force reports mapping out an extremely ambitious agenda and calling for a high degree of collaboration among users and vendors.

The group brings together users, vendors and service providers to work toward resolving significant interoperability problems that complicate distributed computing. A big first step in that process is developing a common set of rules and definitions to ensure that everyone is speaking the same language.

"These reports highlight some of the most critical multivendor issues users are facing today," said Elaine Bond, OURS chairwoman. "OURS has identified these problems and developed a generic framework that can be used to begin solving them. The needed ingredient now is full industry cooperation."

Officials with the task forces acknowledge that achieving their goals will be tough, but they can make some progress if more organizations get behind the OURS initiatives.

In its report, for example, the What Works With What (W4) task force outlined its plans for a reference architecture for the exchange of interoperability information among vendors and users.

Under this scheme, W4 has identified more than 300 software and hardware products it hopes to include in a catalog that will define the products' basic qualities, components and features. Vendors would have to provide descriptions of their products based on those definitions. The products would then be mapped to the reference architecture to make it easier for users to determine if different products will interoperate.

W4's task is herculean, given that the original 300 products represent the tip of the iceberg in terms of available offerings.

"This may seem daunting at first, but it's doable," said David Harwood, cochairman of the W4 task force. "Mapping the products to this architecture we've developed is easy. The hard part is getting vendors to define products in this OURS-compliant way."

OURS distributes the load

The missions of OURS' task force panels:

Network Management

To develop a framework for managing and operating networks and networked applications to reduce maintenance and administration costs.

Software Licensing

To make users and vendors more aware that alternate license models exist and to develop a common lexicon.

Data Security

To pursue tactical solutions to data processing security issues and provide a forum for users and vendors to develop a synergistic view of those issues.

What Works With What

To identify opportunities for improving the general availability of and access to information about computer products and how they interoperate.

GRAPHIC BY SUSAN SLATER

Building industry momentum is a challenge OURS' Software Licensing task force also faces. In its report, the group released a 150-word lexicon that defines key terms used in the software licensing process.

If users and software providers abide by the definitions in the lexicon when negotiating a license, fairness could be achieved, said task force cochairman Darrell Ackman, director of business practices at Software AG of North America, Inc. "For example, 'concurrent user' could mean different things to different people," Ackman said. "The lexicon offers a common ground on that front, but it won't mean anything unless we can get it out into the industry."

Similarly, the Network Management task force defined the 10 essential requirements of directory and authentication services. By building to a common set of requirements, vendors could provide products that share a common look and feel, easing the integration and updating of different directories, said Ali Tabrizi, the task force cochairman.

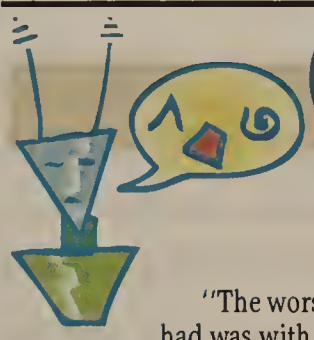
In addition to these services, users are also clamoring for help with the increasingly large number of passwords and logons they must employ on a daily basis to access applications and services. The Data Security task force addressed that problem in a report examining the feasibility of a single sign-on.

"Users have too many passwords," said Emil DeAngelo, cochairman of the task force. "It ends up defeating the purpose of security because users end up writing them all down on a Post-it Note and sticking it onto their PC since they can't remember the six different versions they have."

In its interim report, the task force outlined the requirements for single sign-on and provided a product matrix that details how well existing products meet those requirements. The group's final report, which is expected in the third quarter, will include user surveys that evaluate the accuracy of that product matrix.

"OURS has undertaken a full agenda, but the importance of its work can't be overemphasized," said Christopher Leone, local-area network analyst at Morgan, Lewis & Bockius, an international law firm in Philadelphia. "It's the perfect place for users to band together and push the vendors into complying with these recommendations."

✆OURS: (212) 938-5534.



CyberSpeak: *Voices from the reader network*

What is the worst experience you have ever had with a new networking product?

"The worst experience we had was with an auditing product called LAN Auditor. We loaded it up and ran it, and it completely destroyed the operating system. It wreaked complete havoc on the system. It tore the server to pieces in production mode — it crashed the server with a whole bunch of files open, so it tore up parts of the file structure. It took us two days to get the system back to normal."

Ed Froste, director of management information services, Kentucky Housing Corp., Frankfort, Ky.

"Taking the tape and unloading it, only to find that they sent me the wrong damn product. Also, finding out that a product hyped up to walk on water is bug-ridden. Marketing is so intent on getting a product out the door that they ship bug-ridden releases. They're letting product out the door and letting the end user debug the damn thing for them. Most of these shops that have products I've looked at, they need to really tighten up on their quality assurance."

Frank Belland, senior communications consultant, Martin Marietta Corp.

"The worst experience we've had was attempting to put in [Fiber Distributed Data Interface] between our file servers. We had just upgraded from [Novell, Inc.] NetWare 3.11 to 3.12 and wanted to tie our file servers together using FDDI. So we got the cards and the installation from [National Semiconductor Corp.]. But when they installed the cards, they loaded earlier versions of [NetWare Loadable Modules] that were incompatible with NetWare 3.12. The file servers came up, and after about an hour, they locked up. We rebooted the servers, and again, after about an hour — after users started accessing files — the servers locked up. It took us about three days to get back to where we were when we started. But we never got it fixed — we're still running copper between our file servers."

Ed Thomas, network manager, Stanley communitiy College, Alberbare, N.C.

NextWeek CyberSpeak Out!

What do you think about the federal government dropping its OSI-only procurement mandate and recognizing TCP/IP as an open systems standard equal to OSI?

Responses due by 8 p.m. Thursday, March 24. T-shirts for those whose responses are printed.

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IEEE group accepts plan to double wireless LAN speed

BY CHRISTINE BURNS

Vancouver

An IEEE standards body has embraced a data transmission technology that would effectively double the throughput of existing wireless LANs.

The IEEE's 802.1 committee last week accepted a proposal pitched by Proxim, Inc. that specifies a 2M bit/sec data transmission option for frequency hopping spread-spectrum wireless local networks. If incorporated in products, the technology would bring the speed of wireless LANs closer to that of wired LANs.

The Proxim technology was accepted as a higher speed option to the 1M bit/sec base data transmission scheme accepted last July. Products built to either speed will be able to interoperate. The speed selection is done via software in both wireless devices that negotiates whether they communicate at 2M bit/sec or fall back to the slower rate.

Proxim's plan was accepted over proposals offered by LANNAIR, Ltd. and Symbionics Corp. It received 90% approval before a physical-layer working group and 80% approval before the entire 802.1 committee.

"This technology gives users the option to send and receive data at high speeds but also protects their investment in devices that can only handle the lower speeds," Proxim's President David King said.

"These new adapters are running at speeds that are much closer to what we've seen with wired nets."

This dual-mode approach has been implemented in Proxim's RangeLAN2 adapters that will begin shipping laterthis month.

Tony Formby, president of Merrimac Hospitality Systems, Inc., a systems integration firm in Carrolton, Texas, has been testing Proxim's RangeLAN2 adapter with point-of-sale applications. "Proxim's first generation products just weren't fast enough for transaction-based applications or sending large files. But these new adapters are running at speeds that are much closer to what we've seen with wired nets," he said.

The acceptance of this high-speed physical layer standard, coupled with the media access control layer standard approved last November, puts the committee on its way to defining a wireless LAN specification. A draft standard is expected by the year end.

"The acceptance of Proxim's proposal has probably shaved a year off the standards effort," said Porche Isaacson, president of Dream IT, Inc., a research marketing firm in Colorado Springs. "The things holding back a boom in the wireless market are standards and speed, and Proxim has got a handle on both."

Rifaat Dayem, president of the Ultima Research, Inc. in Cupertino, Calif., said while the speed enhancement will held expand the wireless LAN mart, there are other variables that may stunt its growth. "We have to still address the cost and security issues," Dayem said.

The Yankee Group, a Boston market research firm, estimates the average cost of installing a wireless LAN at $1,107 per user, compared with $780 and $880 for Ethernet and token-ring LANs.

Sybase, Epoch team up for database backup

BY PETER LISKER

Emeryville, Calif.

Sybase, Inc. and Epoch Systems, Inc. have announced an agreement under which the companies will integrate Epoch's Enterprise Backup software with the Sybase SQL Server database environment.

Enabling Sybase's Backup Server to support Epoch's product will give users advanced cataloging, scheduling and backup management facilities.

"The melding of Epoch and Sybase technology will be a welcome addition to Sybase's corporate database users who have to back up very large databases across the network," said Richard Finkelstein, president of Chicago-based database consulting firm Performance Computing, Inc. "Backing up large server databases is a fundamental component of ensuring database availability and integrity, and is often ignored by the database vendors."

The Enterprise Backup software, a server-based product, allows users to back up and recover databases across networks. The product allows unattended backups at scheduled times to the same or a different server on which the target database resides.

In addition, the product automatically catalogs and creates log entries showing the status of the backups. These capabilities will mean that users will no longer have to manually initiate backup or recovery operations, as was previously the case with Sybase's backup facility.

The product has a knowledge-based, intelligent autoscheduling feature that is specifically designed for the Unix environment, which is Sybase's traditional strength. The Enterprise product also features a graphical user interface and includes a comprehensive set of monitoring, reporting and self-service recovery services.

Under the terms of the deal, Sybase will provide a new application program interface (API) to its System 10 Backup Server, the backup software currently bundled with the System 10 SQL Server. The new API will enable Epoch to customize the backup software to work with SQL Server databases.

"Epoch is the leader in mainframe-class backup systems for client/server environments and will give Sybase users the best backup facilities in the distributed database server environment," said Karen Fredricksen, director of Sybase's server products group.

Support for the product, which will be available by the end of the third quarter, will be provided by both companies. Pricing is not yet available.

BranchCard

Continued from page 1

Unix servers.

The router will support Ethernet, token-ring and serial synchronous interfaces, as well as common local-area network protocols, such as Transmission Control Protocol/Internet Protocol. It will also support the Open Shortest Path First and Cisco's Interior Gateway Routing Protocol.

Each card has four slots that can each support two PCs, for a total of eight users per board. As many as four boards, or 32 users, can be supported by the BranchCard software. The router will have a single wide-area interface supporting speeds up to T-1.

The BranchCard hub supports coaxial and twinaxial wiring, which will connect a variety of terminals and PCs simultaneously.

Probably one of the most important features of the BranchCard hub/router, however, is that users will have the option of managing it from host-based NetView or an SNMP manager, such as IBM's NetView/6000 or Hewlett-Packard Co.'s OpenView.



GRACE

Grace said the BranchCard software contains NetView and SNMP agents. The BranchCard also supports Novell, Inc.'s Hub Management Interface, allowing it to be managed by Novell's NetWare Management System.

"In most cases, SNA users are forced to buy an SNMP management platform or buy some sort of gateway to let NetView know the hub/router devices are there," Grace said. "Either way, that's unacceptable."

Blue Cross/Blue Shield of Connecticut in North Haven agreed. "Our legacy managers want to know what we are doing with our LANs," said Graham Morrison, project leader for network design at the firm. Morrison said he expects to evaluate the LanOptics BranchCards as soon as they become available.

"We'd like to see them put in an integrated [data service unit] or at least offer it with the package," he said.

"With the NetView support and Cisco routing functions, SNA users will find the products especially useful in the integration of remote LANs," said Anura Guruge, an independent analyst in New Ipswich, N.H.

In addition to the hub/router card, LanOptics will roll out eight-port 10Base-T and token-ring hub cards, and software for use in Intel-based PCs. As many as four of the cards can be daisy-chained, and both cards can be managed by NetView or an SNMP manager.

The BranchCards will be available in April. The hub/router card will cost $800, while the token-ring and Ethernet hub cards will cost $840 and $700, respectively.

LanOptics: (214) 392-0647.

Lotus, AT&T to develop national Notes service

BY ADAM GAFFIN

Lotus Development Corp. and AT&T last week unveiled plans for a public Notes service that will give companies a new way to interact with remote employees, business partners and customers.

The service could also provide an option for companies that want to use Notes but do not want to bother with maintaining their own internal Notes networks, especially over a wide area, officials at the companies said.



MANZI

AT&T Network Notes will consist of a series of Notes servers maintained by AT&T that end users can dial into using existing Notes client software or a low-cost, stripped-down client Lotus is developing. The servers will be located across the country and connected by a T-1 frame-relay backbone.

The service is scheduled to go into beta test in the third quarter, with an official launch early next year. The new client software will let users view and retrieve information, including multimedia files, but will likely not include the ability to design forms or create work flow and related applications, officials said.

Lotus President Jim Manzi said several large Notes users will participate in the early testing using existing Notes clients. These include the Price, Waterhouse accounting firm in New York and Johnson & Higgins, a private insurance company, also in New York.

The service will incorporate Notes' existing information-sharing functions, including the ability to hold public and private conferences and exchange electronic mail, documents, software and other files.

E-mail gateways will link Notes service to other services such as AT&T's EasyLink and the Internet.

Heidi Dix, an analyst in the software service of Forrester Research, Inc., in Cambridge, Mass., said the service could prove especially attractive to companies seeking to go on-line with business partners, because of the current complexities of setting up intercorporate data links.

"It has the potential to be really huge because nobody else really has the combination of software that Notes has and, for business, the cache that AT&T has," Dix said.

Letting AT&T worry about network configuration and maintenance could make it eaiser for the Travelers Insurance Co. in Hartford, Conn., to extend Notes applications now used mainly at headquarters to hundreds of field offices and independent agents across the country, Director of Telecommunications John Murphy said.

The Travelers has about 1,100 Notes users among its 30,000 employees.

However, Murphy said he would need to scrutinize the costs of using the service as well as the functionality of the new client.

Officials declined to discuss specific pricing for either the service or the client. Erik Grimmelmann, manager of new business services for AT&T, said AT&T will likely offer a flat-rate basic connection service, initially up to 14.4K bit/sec, with additional value-added charges. Manzi said Lotus will share in the revenues from these services.

Larry Moore, vice president for telecommunications services at Lotus, said the companies should be able to start up the network without major modification to the servers.

Wolf Communications, Inc. began offering a similar Notes service called WorldCom earlier this year.

NETWORK WORLD

The Newsweekly of Enterprise Network Computing

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Title

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1 Industry: (check one only)

01. ☐ Manufacturers (other)
02 ☐ Finance/Banking
03 ☐ Insurance/Real Estate/Legal
04. ☐ Healthcare Services
05. ☐ Hospitality
06. ☐ Retail/Wholesale Trade/Business Services
07. ☐ Transportation
08. ☐ Utilities
09 ☐ Education
10 ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
11 ☐ Government (Federal/State/Local)
12. ☐ Military
13. ☐ Aerospace
14. ☐ Consultants (Independent)
15. ☐ Carriers/Interconnects
16. ☐ Manufacturers (Computer/Communications)
17. ☐ VAR/VAD/VAN/Systems Houses/ Software Houses
18. ☐ Distributors,Communications/Computers
19 ☐ Other_____

2 What is your Job Function? (check one only)

NETWORK IS Management:
1. ☐ Networking Management
2 ☐ LAN Management
3 ☐ Datacom/Telecom Management
4 ☐ IS,IT,MIS,Systems Management
5. ☐ Engineering Management

CORPORATE MANAGEMENT:
6. ☐ Corporate Management (CIO,CEO,PRES,VP, DIR,MGR,Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other_____

3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+ 3. ☐ 20 - 49 5. ☐ 2 - 9 7. ☐ None
2. ☐ 50 - 99 4. ☐ 10 - 19 6. ☐ 1

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)

1 ☐ Corporatewide
2. ☐ Multienterprise
3 ☐ Departmental
4 ☐ None

B. INVOLVEMENT (check all that apply)

1. ☐ Recommend/Specify
2 ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

5 Check ALL that apply in columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services.

A	B	LOCAL AREA NETWORKS
☐ 01.	☐	Local Area Networks
☐ 02.	☐	LAN Operating Systems Software
☐ 03	☐	LAN Services
☐ 04	☐	LAN Storage Devices (optical,tape,disk,etc.)
☐ 05.	☐	LAN Backup systems (optical,tape,disk,etc.)
☐ 06.	☐	Network Test Equipment
☐ 07.	☐	Intelligent Hubs
☐ 08	☐	Cables, Connectors, Baluns
☐ 09	☐	UPS
☐ 10	☐	Network Adapter boards
☐ 11	☐	Peer-to-Peer LANs
☐ 12.	☐	Wireless Networks
☐ 13	☐	SNMP Network Management
☐ 14	☐	ATM (Asynchronous Transfer Mode)
☐ 15.	☐	Remote Access LANs

A	B	NETWORK SERVERS
☐ 16.	☐	LAN Servers
☐ 17	☐	File Servers/Applications Servers
☐ 18	☐	Print Servers
☐ 19	☐	Communications Servers/Fax Servers
☐ 20	☐	Data Base Servers (Oracle, Sybase, etc.)
☐ 21	☐	Superservers
☐ 22	☐	Terminal Servers
☐ 23	☐	Remote Access Servers

A	B	INTERNETWORKING
☐ 24.	☐	Bridges
☐ 25	☐	Routers
☐ 26.	☐	Gateways
☐ 27.	☐	Bridge/Routers
☐ 28.	☐	Intelligent Hubs
☐ 29.	☐	Communications Servers

A	B	COMPUTERS/PERIPHERALS
☐ 30.	☐	Micros/PCs
☐ 31.	☐	Minis
☐ 32.	☐	Mainframes
☐ 33.	☐	Pen-Based
☐ 34.	☐	Laptops
☐ 35.	☐	Workstations
☐ 36.	☐	Image Processing Workstations
☐ 37.	☐	Front-End Processors
☐ 38.	☐	Terminals
☐ 39.	☐	Printers
☐ 40.	☐	Cluster Controllers
☐ 41.	☐	Fax Machines
☐ 42.	☐	X-Terminals

A	B	SOFTWARE/APPLICATIONS
☐ 43.	☐	Network Management
☐ 44.	☐	Micro to Mainframe
☐ 45.	☐	Security
☐ 46.	☐	Communication/Terminal Emulation
☐ 47.	☐	Word Processing
☐ 48.	☐	Operating Systems
☐ 49.	☐	Business Applications (Finance/Mfg/HR/etc.)
☐ 50.	☐	Applications Development
☐ 51.	☐	Data Base Management
☐ 52.	☐	Spreadsheet
☐ 53.	☐	Groupware
☐ 54.	☐	EDI
☐ 55.	☐	E-Mail
☐ 56.	☐	Windows/Graphical User Interface
☐ 57.	☐	4GL Development
☐ 58.	☐	Multimedia
☐ 59.	☐	Graphics
☐ 60.	☐	Remote Access

A	B	WIDE AREA NETWORKS
☐ 61.	☐	Modems (9.6K bps and over)
☐ 62.	☐	Modems (under 9.6K bps)
☐ 63.	☐	T-1
☐ 64.	☐	T-3
☐ 65.	☐	Fractional T-1
☐ 66.	☐	Data Switches
☐ 67.	☐	SMDS
☐ 68.	☐	ATM (Asynchronous Transfer Mode)
☐ 69.	☐	Matrix Switches
☐ 70.	☐	Packet Switches
☐ 71.	☐	Protocol Converters
☐ 72.	☐	Diagnostic/Test Equipment
☐ 73.	☐	DSU/CSU
☐ 74.	☐	Microwave
☐ 75.	☐	Fax Boards/Modems
☐ 76.	☐	VSAT
☐ 77.	☐	Fiber Optic
☐ 78.	☐	Satellite
☐ 79.	☐	ISDN
☐ 80.	☐	PBXs (over 1000 lines)
☐ 81.	☐	PBXs (under 1000 lines)
☐ 82.	☐	Automatic Call Distributors
☐ 83.	☐	Voice Messaging Systems
☐ 84	☐	Videoconferencing/Teleconferencing Systems
☐ 85.	☐	Voice Response/Processing
☐ 86.	☐	Dedicated Leased Line
☐ 87.	☐	Switched Data
☐ 88.	☐	Centrex
☐ 89.	☐	E-Mail/Online Services
☐ 90.	☐	Image Processing
☐ 91.	☐	Local Services
☐ 92.	☐	WATS/MTs
☐ 93.	☐	International
☐ 94	☐	Virtual Networks
☐ 95.	☐	Frame Relay
☐ 96.	☐	Value Added Services
☐ XX.	☐	None of the above(1-96)

6 What is the total number of A:LANs B: Workstations/Nodes in your organization?

	LANs A	Workstations/Nodes B
1	☐ 5,000+	☐
2.	☐ 1,000 - 4,999	☐
3.	☐ 100 - 999	☐
4	☐ 50 - 99	☐
5.	☐ 10 - 49	☐
6.	☐ 9 or less	☐

7 Which of the following network platforms are currently installed/planned? (check all that apply)

NETWORK ARCHITECTURES

Installed A	Planned B	
☐ 01.	☐	SNA
☐ 02	☐	DECNET
☐ 03.	☐	MAP/TOP
☐ 04.	☐	TCP/IP
☐ 05.	☐	DCA (Unisys)
☐ 06	☐	X 25
☐ 07.	☐	Novell IPX/SPX
☐ 08	☐	APPC/APPN/LU6.2
☐ 09	☐	NETBIOS
☐ 10.	☐	OSI

Installed A	Planned B	
☐ 11.	☐	APPLETALK
☐ 12.	☐	OTHER_____

LAN OPERATING SYSTEM

☐ 13.	☐	LOCALTALK (APPLETALK)
☐ 14	☐	BANYAN (VINES)
☐ 15.	☐	DCA (IRMALAN)
☐ 16	☐	DCA (10-NET)
☐ 17.	☐	IBM (LAN SERVER)
☐ 18.	☐	IBM (PC LAN PROGRAM)
☐ 19	☐	MICROSOFT (LAN MANAGER)
☐ 20.	☐	UNGERMANN-BASS (NET/1)
☐ 21.	☐	NOVELL (NETWARE,2X,3X,4X)
☐ 22.	☐	PROTEON (PRONET)
☐ 23.	☐	SITKA (TOPS)
☐ 24.	☐	3COM (3+,3+OPEN)
☐ 25.	☐	ARTISOFT (LANTASTIC)
☐ 26.	☐	HAYES (LANSTEP)
☐ 27.	☐	DEC (PATHWORKS)
☐ 28.	☐	OTHER_____

LAN ENVIRONMENT

☐ 29.	☐	4M TOKEN RING
☐ 30.	☐	16M TOKEN RING
☐ 31.	☐	ARCNET
☐ 32.	☐	ETHERNET
☐ 33.	☐	STARLAN
☐ 34.	☐	FDDI
☐ 35.	☐	LOCAL TALK
☐ 36.	☐	10BASE-T
☐ 37.	☐	OTHER_____

OPERATING SYSTEM

☐ 38.	☐	DOS
☐ 39.	☐	UNIX/XENIX/AIX
☐ 40.	☐	OS/2
☐ 41.	☐	OS/2 2.X
☐ 42.	☐	MVS
☐ 43.	☐	VM
☐ 44.	☐	VMS
☐ 45.	☐	MACINTOSH
☐ 46.	☐	WINDOWS
☐ 47.	☐	WINDOWS NT
☐ 48.	☐	X WINDOWS
☐ 49.	☐	SOLARIS
☐ 50.	☐	OTHER_____

8 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

	Mainframes Installed	Mainframes Planned	Minis Installed	Minis Planned
01. IBM	☐	☐	☐	☐
02. DEC	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER _____	☐	☐	☐	☐

MICROCOMPUTERS
(fill in the numbers)

	INSTALLED	PLANNED
11. Macintosh 20,30,40		
12. Macintosh other		
13. PCs based on Pentium		
14. PCs based on 80486		
15. PCs based on 80386		
16. PCs based on 80286		
17. PCs based on 8086/8088		
18. RISC/Unix based wkstns		
19 Other		

10 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

1. ☐ $100 million and over
2. ☐ $50 - $99.9 million
3. ☐ $25 - $49 9 million
4 ☐ $20 - $24 9 million
5. ☐ $10 - $19.9 million
6 ☐ $5 - $9.9 million
7 ☐ $1 - $4.9 million
8. ☐ $500,000 - $999,999
9 ☐ $499,999 or less

11 Estimated gross annual revenues of your entire company/institution: (check one only)

1. ☐ Over $10 billion
2. ☐ 1 to $9.9 billion
3 ☐ $500 to $999.9 million
4 ☐ $100 to $499.9 million
5. ☐ $50 to $99.9 million
6. ☐ $10 to $49.9 million
7 ☐ $5 to $9.9 million
8 ☐ $4 9 million or less

12 Estimated number of employees for your entire corporation: (check one only)

1 ☐ Over 10,000
2. ☐ 5,000 - 9,999
3 ☐ 2,500 - 4,999
4 ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

9401

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Symplex enters internetworking mart with bridge

BY SKIP MACASKILL

Ann Arbor, Mich.

Symplex Communications Corp. is planning to enter the internetwork market with a product that relies on digital dial-up carrier services to interconnect local-area networks.

Direct Route is the moniker of a family of connection-oriented bridge products slated to be rolled out in the second quarter. Developed by Symplex, the products will aggregate and compress data to offer increased throughput and performance compared to traditional leased-line routers.

The Direct Route line will be available in remote access versions as well as multiport backbone models.

Since Direct Route will operate at Layer 2 of the network model, it will be classified as a protocol-independent bridge. But support of features such as bandwidth aggregation and data compression will enable the product to compete as an alternative to a traditional router in many cases, according to George Brostoff, chief executive officer at Symplex.

"A router-based network comprised of a series of leased lines can be a significant investment," he explained. "With Direct Route, users can set up point-to-point connections via dial-up switched digital services such as ISDN and lower their network costs since they're only paying for the connection while it's in use."

Symplex

Founded in 1981, Ann Arbor, Mich.-based Symplex is a privately held $15 million company that specializes in WAN access technology.

Direct Route will offer a bandwidth-on-demand feature that allows users to dial up additional connections as they need them. If a user needs to transfer a large bulk file, for example, Direct Route can establish several dial-up links and aggregate the capacity into one larger pipe.

John Hankins, deputy director at CICNet, Inc., an Internet access provider here, has been evaluating several internetwork devices that use Integrated Services Digital Network and is intrigued by Direct Route. The company has just started to evaluate the product.

"Our interest in this product is based on its scalable architecture that will allow it to be used in small, remote locations as well as centralized backbone applications," Hankins said.

"The ability to use multiple ISDN lines to provide bandwidth on demand is also attractive since ISDN will be a key technology for Internet access providers," he added.

Direct Route will also support leased-line interfaces via the Point-to-Point Protocol, which will allow the bridge to communicate with traditional routers. Direct Route will also offer frame relay wide-area services.

Symplex will announce pricing and availability at a later date.

✆Symplex: (313) 995-1555.

IBM pumps up network security

Enhancements make it possible to protect bigger multivendor networks.

BY MICHAEL COONEY

Research Triangle Park, N.C.

IBM last week broadened the scope of its PC-based Network Security Program (NetSP) to make it more useful for users responsible for the security of multivendor enterprise nets.

In the next release of NetSP, IBM said it will add client and server software support for Sun Microsystems, Inc. and Hewlett-Packard Co. Unix workstations and DOS/Windows personal computers. IBM will also add support for Novell, Inc.'s NetWare servers and its LAN Server platform.

Today, NetSP only supports DOS, OS/2 and AIX/6000 clients and OS/2 or AIX/6000 servers (*NW*, Dec. 6, 1993, page 1).

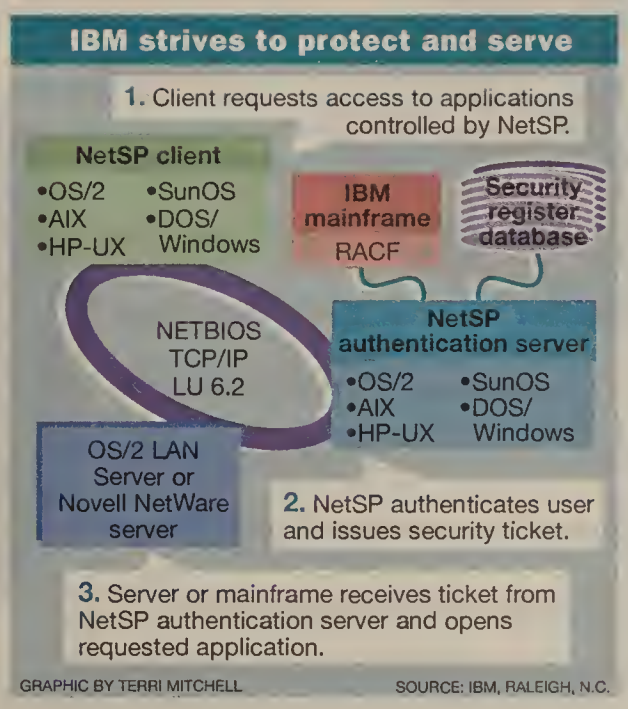
Other new features will include the ability to provide remote access to NetSP resources and the ability to distribute administrative tasks anywhere in the net.

NetSP is a three-tiered product with software components for clients and servers in Network Basic I/O System, LU 6.2 or Transmission Control Protocol/Internet Protocol net environments, and a third piece for a user-designated authentication server. It guards against security infringements by authenticating the identity of users and controlling access to applications.

"NetSP provides users with a single logon to multiple applications and gives security officers a generic way to authenticate users and their access to distributed applications," said Scott Baumann, NetSP market planner.

The new release of NetSP will include the ability to let users access data from remote NetSP servers. Remote users will be able to sign on to any NetSP server and access resources no matter where they are located in the enterprise.

"These features will let us distribute resources further out into the enterprise," said David Gowdy, an advisory analyst with Advantis. Advantis is a value-added network service provider in Schaumburg, Ill., that has been beta-testing the new software. "The ability to communicate securely between NetSP-controlled networks was a necessity if we really were to deploy this technology on a wide scale."



In order to ease security administration, IBM will also make it possible to keep track of NetSP resources and users from remote server locations.

"In the past, these functions were limited to the glass-house administrators," Baumann explained. "Now if administrators want to add users, they can from any NetSP server."

In use, NetSP is invoked when a client workstation requests access to an application on a server anywhere in the enterprise. The request is shuttled through a designated NetSP authentication server that maintains a database of user passwords, IDs and information on access rights.

After confirming the user's identity and access rights, the authentication server issues a "key," or password substitute, to NetSP on the application server, which opens up the requested application.

If the user needs access to another application, the authentication server can grant access without asking the user to go through the initial sign-on and password routine again.

A key feature of NetSP is that it allows user access to applications under IBM's existing MVS and VM mainframe-based Resource Access Control Facility, which controls Systems Network Architecture security.

The new release of NetSP will be available by year end. Pricing will be about the same as the existing release, which is available in a 50-user version for a monthly license fee of $292 or a onetime charge of $7,008. Larger versions supporting approximately 10,000 users are available for up to $400,000.

✆IBM: (919) 254-7416.

BRIEFS

Gold Systems, Inc. has announced network management software that troubleshoots large-scale data and voice networks.

Gold Systems' Smart/1 product is an integrated network management system that is based on a Simple Network Management Protocol platform, but can also troubleshoot non-SNMP devices via a scripting language. It also features a network prototyping capability whereby monitoring designs can be tested and then deployed into fully functional net control systems.

Smart/1 uses a remote procedure call as its application communication mechanism, which lets users configure the system as a distributed management platform.

Smart/1 operates on either an Intel Corp. 486-based workstation under The Santa Cruz Operation, Inc.'s SCO Unix, IBM's AIX-based RISC System/6000 or Sun Microsystems, Inc.'s SPARCstation under SunOS. It supports Informix Software, Inc. and Oracle Corp. databases. The system is available now, and pricing, which depends on configuration, can range from $25,000 to more than $100,000.

Gold Systems: (713) 370-6473.

Advanced Computer Communications (ACC) has announced that its line of bridge/routers received ISO 9002 certification, meaning the manufacturing, inspection, product testing and repair facilities for ACC's product offerings meet the standards established by the International Standards Organization. ISO 9002 is the internationally recognized standard of quality assurance in manufacturing and product support.

CrossComm Corp. has announced it has signed a technical support services agreement with **IBM Canada, Ltd.** Under terms of the deal, IBM Canada will provide on-site technical support for CrossComm's Canadian users who have ExpertCare On-Site service contracts. If remote diagnostics reveal that on-site support is required, CrossComm net services personnel can dispatch an IBM customer support representative to the site.

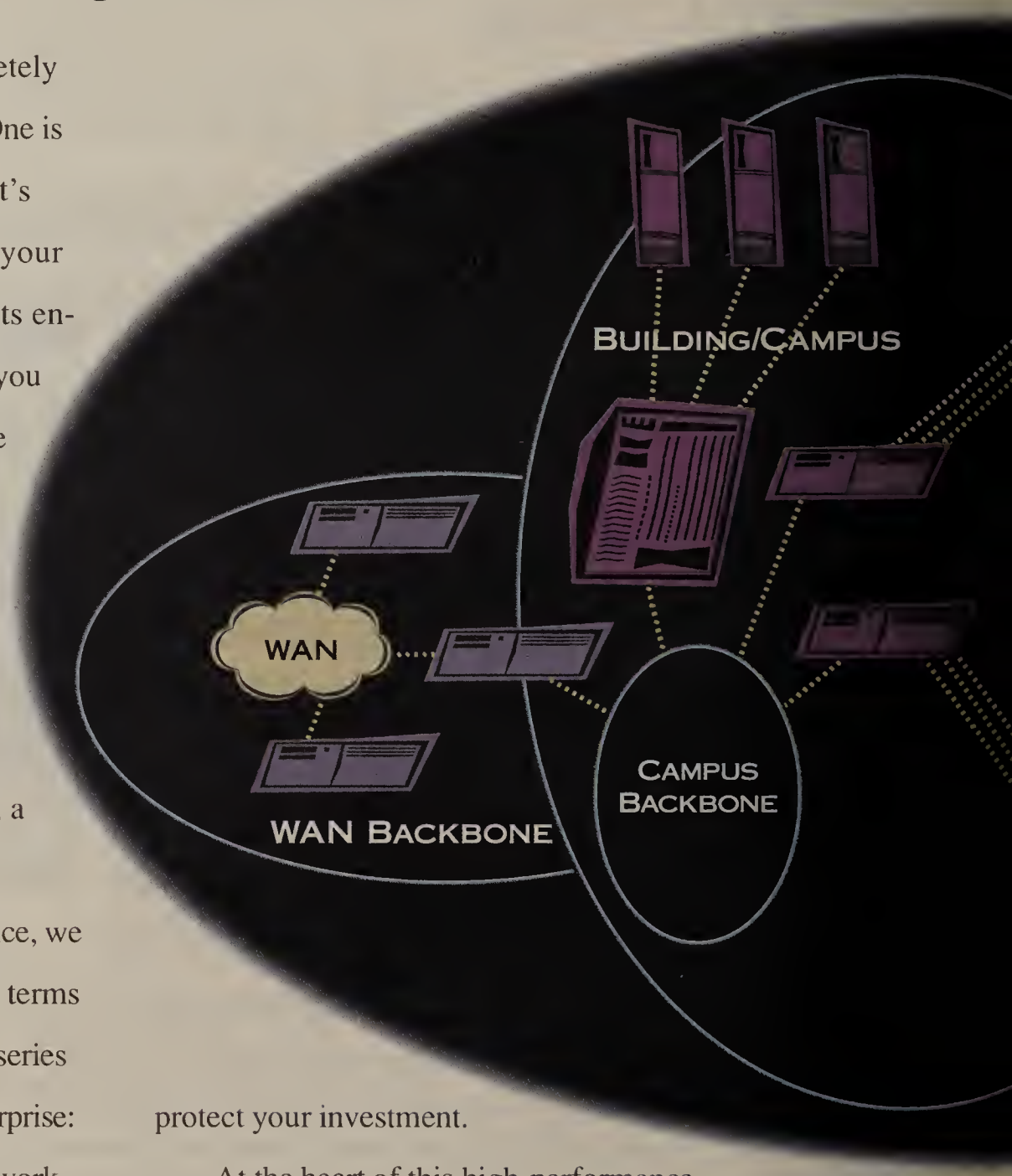
CrossComm: (508) 388-1200.

The **Fibre Channel Systems Initiative (FCSI)**, a joint effort of Hewlett-Packard Co., IBM and Sun Microsystems Computer Corp., announced it has completed the first set of profiles defining how developers of high-speed networking and mass storage products should build conforming products. The goal of the FCSI is to create standard high-speed gigabit channel connections between multivendor products. Profiles are specification definitions developed from the proposed ANSI Fibre Channel standard Version 4.2 that enable the development of open Fibre Channel products.

The whole is always great
Incidentally, in networki

■ As confusing as it sounds, there truly are two completely opposing ways to look at high-performance networking. One is the big picture, the sum total of your network. Because it's only by viewing your network in its entirety that you can be sure it's carrying your organization toward the future without compromising the investments you're making today. Conversely, you can't afford to overlook the smallest detail either. After all, unless it responds and even anticipates the needs of the individuals using it, a network has failed to live up to its potential.





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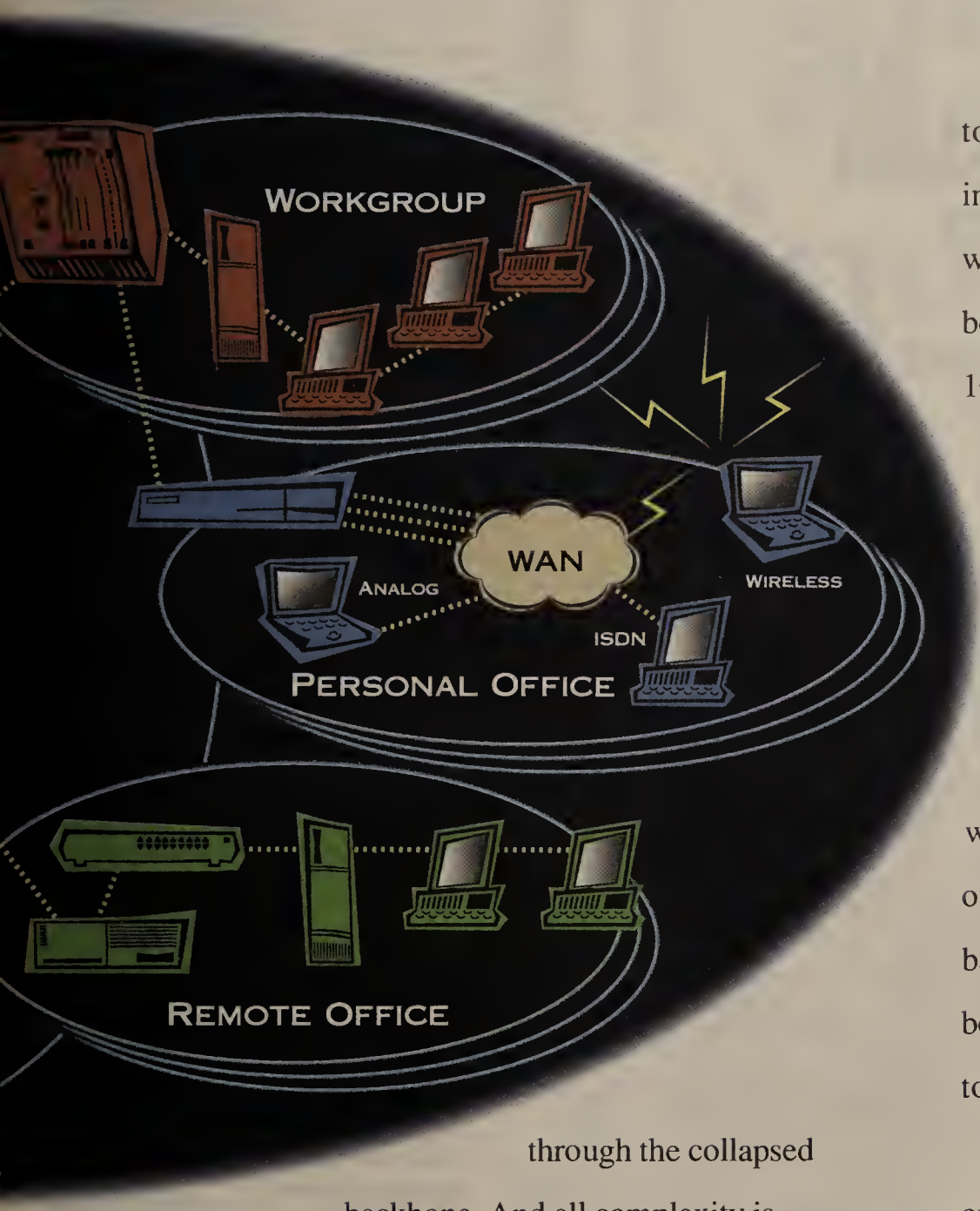
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er than the sum of its parts.
ng the reverse is also true.



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INTERNETWORKING MONITOR

by Scott Bradner

In search of directions through cyberspace

One of the legendary (if one can use that word for an industry just in its infancy) problems with the Internet has been difficulty in locating people, services and resources scattered without discernible pattern across the worldwide network. Over the long term, one can expect that this problem will be solved in a way analogous to the White and Yellow Pages provided by the phone companies. But this is a bit harder in the Internet than for the phone companies for a number of reasons.

For one, the Internet service providers are mostly quite small — big ones have a few hundred customers, and a number of them are in the same region.

This means that the service providers themselves do not have the scale to make their directory information universal enough to be meaningful, and that directory services will most likely have to be provided by independent ventures.



There is currently no well-accepted electronic interface to directory services. The OSI directory services (aka X.500) would be the logical candidate, but in the years that the standards have been available, the software that supports it has not been leaping onto or off of store shelves.

There is no common access control and billing process that would allow any independent directory venture to collect for its services, nothing like the 900 services in the phone system, for example. (To locate a good time, gopher to (900) HOT-BITS.)

Finally, as the MCI commercial so enigmatically put it, "There is no there, it is all here." Considering the type and speed of the Internet infrastructure, one can use a service based 3,000 miles away just as easily as one located down the block and often not be able to tell the difference. As a point of reference, the slowest path between my desk at Harvard in Cambridge, Mass., and a desk at Stanford University in Stanford, Calif., is a 10M bit/sec Ethernet.

Any directory service would have to be able to provide information about services everywhere in the world. This is a bit of a scale and logistical issue involving, among other things, a surfeit of natural languages.

Directory services will come in time. But meanwhile, some service providers have grown tired of waiting and are trying to use the Internet the way telemarketers use the phone system — sending unsolicited advertising. But it's not just service providers. Messages that are best categorized as advertisements cover subjects including Ethernet interfaces, bulletin boards, bookstores and even the end of the world.

Considering the type and speed of the Internet infrastructure, one can use a service based 3,000 miles away just as easily as one located down the block.

This can be quite a problem. In the telephone world, there is a limit to the number of calls you can make simultaneously.

There is no such limit on the Internet. One can send a message that will go to literally millions of people, and, because of flat-rate pricing, doing this will cost no more than sending one letter.

More on this in a future column. Meanwhile, I'll leave you with a somewhat stretched analogy.

Experiencing unsolicited advertising on the information highway is a bit like driving a convertible under a flock of sea gulls on old Route 1. You hope that you are lucky enough to have the top up whenever it happens, and even then, it is not the high point of one's day.

Disclaimer: (from R. Kevin Oberman) Don't take this too seriously. I just like to improve my typing.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

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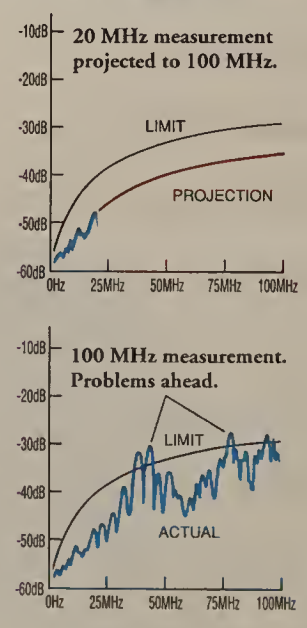
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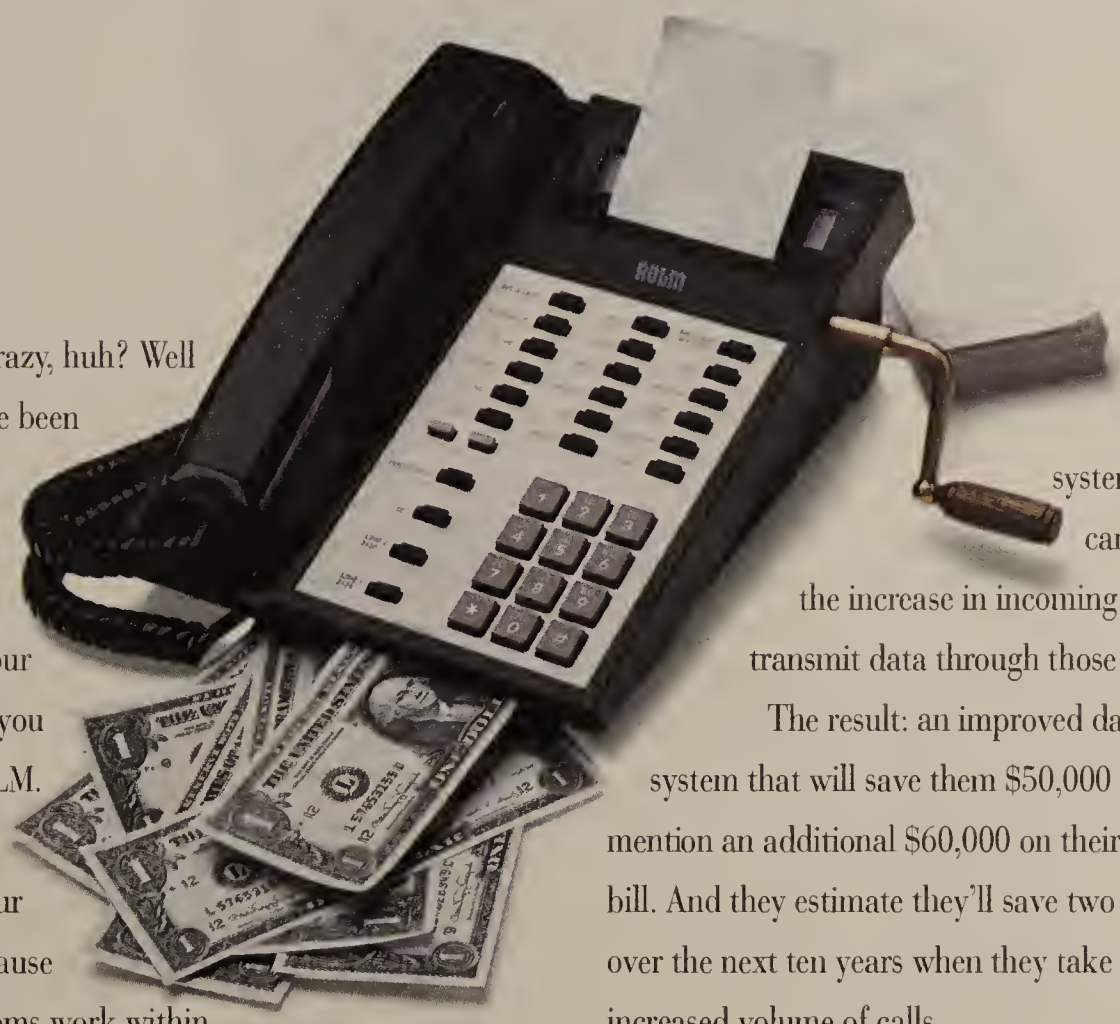
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Cylink unveils portable DES encryption unit

BY ELLEN MESSMER

Sunnyvale, Calif.

Cylink Corp., a maker of encryption products, recently introduced a palm-sized Data Encryption Standard (DES) encryptor for use with mobile computers and dial-up links at speeds up to 19.2K bit/sec.

The Cylink Low-Speed Asynchronous (LSA) Encryptor uses dual-key technology to authenticate the user's identity before allowing network access, which simplifies key management exchange between both drives.

The LSA Encryptor is the smallest encryption unit Cylink offers and is backward-compatible with the firm's larger, higher-speed encryptors. "The LSA is targeted at the mobile computer user because of its size, weight and features," said Al Hussain, director of product-line management at Cylink.

The LSA Encryptor weighs less than 2 pounds and plugs into the RS-232 ports between the user's modem and computer. Compatible with the AT command set, the device automatically adjusts to employ the same baud rate the modem is using.

When dialing in from the road, Cylink's proprietary dual-key management system is used to determine if access should be permitted. If the key in the remote user's unit matches a secret key in the host device, the user is connected to the net. If not, the user is denied access.

Once connected, the user can both encrypt the data he sends and unscramble data encrypted by the host LSA Encryptor. "Encryption and decryption is full duplex, taking place in real time in both directions," Hussain said. "It all takes place transparent to the user."

The palm-sized encryptor

Cylink's portable LSA Encryptor, weighing just 1 3/4 pounds, is 5 1/4 inches wide by 5 inches deep by 1 1/2 inches high.

CYLINK

A single LSA would suffice as the host encryption device for limited use. But corporations with substantial call volumes from mobile workers would require at least one rack-mounted Cylink Multi-Line Shelf to handle incoming calls.

Each 19-inch rack-mountable shelf holds as many as 12 LSA cards for up to 12 simultaneous calls. The shelves can be linked to support 400 simultaneous users.

The 19.2K bit/sec LSA unit also works with Cylink's larger encryption devices, the Medium Speed (MS) unit, which supports up to 768K bit/sec and the 25-pound CIDEC-LS, which operates at up to 256K bit/sec.

The CIDEC-LS and MS plug into the same Multi-Line Shelf that holds the LSA cards.

The LSA portable unit costs $795; volume discounts are available.

✆Cylink: (408) 735-5800.

Make Systems tool tracks packets

BY JIM DUFFY

Mountain View, Calif.

Make Systems, Inc. this week will announce a traffic analysis tool for its network design software that allows managers to determine the mix of traffic on their router-based backbone by application.

The new tool, called Interpreter, enables managers to identify the source and destination of multiprotocol packets. Managers can then track how much of a specific traffic type is being transmitted across the wide area and plan bandwidth capacity accordingly.

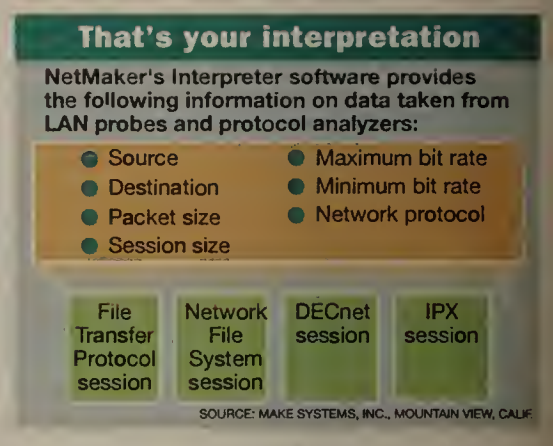
The software gathers data from local-area network packets captured in real time by protocol analyzers and LAN probes. Currently, Interpreter works with analyzers and probes for Ethernet, token-ring and Fiber Distributed Data Interface LANs made by Concord Communications, Inc. and Frontier Software.

The Concord and Frontier devices capture Transmission Control Protocol/Internet Protocol, Xerox Corp.'s Xerox Network Systems, Internetwork Packet Exchange (IPX), AppleTalk and DECnet packets. Raw traffic data is then forwarded to the NetMaker workstation where it is merged and consolidated into a detailed representation of network conversations and station information.

Interpreter then converts this data into application profiles containing data on the application name, protocol type, media access control-layer address, minimum and maximum bit rates, and the amount of traffic activity. Using this data, managers can develop models of network traffic required to plan and design network configurations, including bandwidth requirements, Make said.

Analysts were impressed with Interpreter and said it will give Make a leg up on competitors CACI Products Co. and Comdisco Systems, Inc.

"They are the first vendor that I know of who's actually using live LAN monitor data as an input mechanism into the design and modeling tool," said John Morency of Strategic Networks Consulting, Inc. in Rockland, Mass. "That is a real leadership product."



Interpreter costs $1,250 to $12,625, depending on the number of router nodes. Interpreter is available now and includes interfaces to analyzers and LAN probes from Concord and Frontier, respectively.

✆Make: (415) 941-9800.

Comments?

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Circle Reader Service #4

PSI rolls out new version of Origen software

BY CARYN GILLOOLY

West Haven, Conn.

Preferred Systems, Inc. (PSI) has impeccable timing.

Just as Novell, Inc. announced it will be delaying release 4.1 of NetWare — the version that will include better integration between NetWare 3 and NetWare 4 — PSI released a new version of Origen, a product that helps in the NetWare migration.

In addition to the bindery emulation capabilities offered in Origen 3, Origen 4 offers users even more features geared toward customers with enterprise nets, including password synchronization and multiserver configuration capabilities.

"We started using Origen a long time ago," said Gene Mazurek, co-owner of Bancroft & Masters, Inc., a Novell platinum reseller and systems integrator in Redwood City, Calif. "But this [release] will make the Origen software even more appealing for larger 3.Xsites."

Analysts agreed. "This is an important release, particularly with the delay of NetWare 4.1," said Jack Karp, president of Affinity Research Corp., a consulting firm in Greenwich, Conn.

Highlights of Origen 4

- SynchPass lets administrators synchronize passwords across an unlimited number of servers.
- Multiserver configuration capabilities allow administrators to add users on many servers simultaneously.
- Print job distribution capabilities enable administrators to configure print jobs by user group, rather than by individual user.
- OS/2 support.
- Disk restriction capabilities that let the administrator limit disk space by directory level, rather than by individual user.
- Enhanced NetWare 4 functionality.

ENTERPRISE FEATURES

Central to the new release is SynchPass, a password synchronization tool that ensures that a user's password is the same across all servers.

If a user tries to access a particular server and access is denied, the user or administrator can activate the program and the passwords will be synchronized automatically.

SynchPass can synchronize passwords across an unlimited number of NetWare servers, helping users overcome the eight-server logon limitation of Novell's Internetwork Packet Exchange (IPX). Since no user can be logged on to more than eight servers at once, updating passwords on more than eight servers can be nettlesome.

"In any industry, people need to change passwords more and more frequently," said Jeff Pustay, second vice president at Chase Manhattan Bank, N.A. in New York. The Chase network consists of about 200 NetWare servers supporting more than 5,000 users.

"Password synchronization is a key issue for us," Pustay added, "and [Origen 4] is an important tool for password synchronization."

Origen 4 also includes a multiserver configuration capability, which allows an administrator to add a new user, for example, to all servers simultaneously rather than having to add that user to each individual server.

"This lets you hit a button and configure multiple

See **Origen**, *page 25*

DG makes server, RAID splash at CeBIT

BY CHRISTINE BURNS

Hannover, Germany

Data General Corp. last week unveiled at the Hannover Fair CeBIT a low-end addition to its AViiON family of RISC-based servers, demonstrated a clustered server configuration that can support enterprise database applications and enhanced its Clariion RAID products with support for Microsoft Corp.'s Windows NT.

According to Steve Aucoine, manager of product marketing at DG, the AViiON 4500 is a deskside machine with a single Motorola, Inc. 40-MHz processor that can support as many as 32 users. The server has 16M bytes of memory expandable to 256M bytes and can support up to 2G bytes of external storage. The AViiON 4500 will be priced at less than $10,000 and will ship within 60 days.

CeBIT '94

AV Clusters is a new server configuration that allows as many as four AViiON servers to work together across a network. A software component of DG's proprietary Unix operating system, DG-UX, makes the servers appear as a single system to users.

"This system can support mission-critical applications because it offers constant availability," Aucoine said. "If one server goes down, the other three will balance the load with little effect on the application or end user."

Jim Lardear, an analyst with the Delran, N.J.-based consultancy Datapro Information Services Group, said DG is building on its reputation of shipping high-reliability servers. "Clustering gives users faster response time and protects applications because the system as a whole is never shut down," Lardear said. He added that DG had to offer clustering to keep up with Sun Microsystems, Inc. and Hewlett-Packard Co., which already offer similar capabilities.

Aucoine said the first implementation of AV Clusters incorporates Oracle Corp.'s Parallel Server, which enables a customer to spread the Oracle database across multiple machines. Users access this distributed database using a typical transaction processing front end such as Unix System Laboratories, Inc.'s Tuxedo.

He added that DG will ship the product within 90 days but pricing has not yet been determined.

NEW BACKUP SUPPORT

DG also announced last week that it will now support Microsoft Windows NT servers across its Clariion family of storage disk arrays. The Clariion line had previously only supported Unix-based and Novell, Inc. NetWare servers.

See **CeBIT**, *page 24*

BRIEFS

Rochester, N.H.-based **Cabletron Systems, Inc.** this week will roll out new Ethernet modules for its multichannel **Multi Media Access Center (MMAC)** hub that will support configuration switching. The modules will allow net managers to switch users among the three Ethernet backplanes supported by the MMAC on a per-user or per-module basis entirely through software.

Available in 90 days, the 10- and 13-port models cost $3,995, while the 22- and 24-port modules cost $5,995.

Cabletron: (603) 332-9400.

Network Peripherals, Inc. (NPI) this week will introduce the **Instant Bandwidth Booster for NetWare** system, which is designed to increase server performance in Novell, Inc. NetWare environments. The system consists of an NPI Ethernet-In/FDDI-Out (EIFO) client/server switching hub, an Extended Industry Standard Architecture (EISA) network interface card, Novell certified driver software for the servers, and all associated cabling and documentation.

By placing the server on an FDDI ring, NPI estimates that users can achieve 16 times the performance of a typical shared Ethernet connection.

The Instant Bandwidth Booster package is available now for $8,995.

NPI: (408) 321-7300.

Legato Systems, Inc. last week added support for The Santa Cruz Operation, Inc.'s SCO Unix with the release of NetWorker 4.0.2 for SCO Unix. With the new software, SCO Unix-based servers can be configured as **storage servers** for a departmental local-area net or for an enterprise. The storage server can back up data from other SCO-based servers, as well as from DOS- and OS/2-based clients and clients running a variety of other Unix operating systems.

NetWorker 4.0.2 for SCO Unix is available now for $750.

Legato: (415) 812-6000.

LAN MANAGEMENT

Intel ups net mgmt., analysis offerings with its LANDesk

BY SKIP MACASKILL

Hillsboro, Ore.

Intel Corp. has enhanced its traffic analysis and virus protection software packages with features that provide better security, troubleshooting and performance evaluation in both LAN and enterprise network environments.

The firm also announced that it will bundle two of its most popular local network management applications with Hewlett-Packard Co. OpenView for Windows net management platform, giving users the tools to manage enterprise nets down to the desktop.

With its new 2.1 version of LANDesk Virus Protect, Intel has added support for Novell, Inc. NetWare 4.X environments. Virus Protect guards servers and workstations on NetWare networks against virus infection. It includes software that runs on a personal computer and a NetWare Loadable Module for NetWare servers.

Intel product roundup

Product	Price per server	Availability
LANDesk Traffic Analyst 2.0	$995; $195 as an upgrade from any version of NetSight Analyst	Now
LANDesk Virus Protect 2.1	$995; free upgrade from Version 2.0	April
LANDesk OpenView for Windows	$2,495	Now

The application can now transparently monitor DOS, Windows, Macintosh and OS/2 files, and be directly integrated with Novell's NetWare Management System.

Intel has also optimized Virus Protect to perform faster prescheduled server and workstation virus scans, with no terminate-and-stay-resident (TSR) program required. It offers a centralized audit reporting capability that merges audit logs from multiple file servers.

Intel has also upgraded its NetSight Analyst net analysis software with a new version that has been renamed LANDesk Traffic Analyst. The application displays a real-time summary of packet-level traffic on Ethernet and token-ring LANs and monitors protocol conversations among up to 512 end nodes.

While the previous version

See **Intel**, *page 24*



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It's safe to say that few networked PC users around the world have ever heard of National Semiconductor. Certainly more are aware of Novell.

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NETWARE CONNECTIVITY

SoftNet to let NetWare users access Digital Unix servers

BY CARYN GILLOOLY

Morgan Hill, Calif.

Puzzle Systems, Corp. last week released a new version of its SoftNet Utilities software that will now let Novell, Inc. NetWare users access files on Digital Equipment Corp. Alpha AXP-based machines.

SoftNet Utilities is software that lets a Unix machine emulate a NetWare 2.2, 3.11 or 3.12 server.

The new version adds support for the OSF-1 operating system running on Digital's Alpha platform to the list of others already supported, including SPARC machines running SunOS or Solaris, HP/UX on Hewlett-Packard Co. machines and SCO Unix on multiple platforms.

The product uses Novell's own Internetwork Packet Exchange (IPX) transport protocol and does not require a Transmission Control Protocol/Internet Protocol stack on the client machine, as is necessary with most other NetWare-to-Unix connectivity products.

The software also eliminates the need to perform disk partitioning on the Alpha machine, reconfigure the OSF-1 kernel or load additional drivers on the NetWare machines.

With the software in place, NetWare clients can access files from within the Digital Alpha's file system as though they were located on a NetWare server.

The software also provides bidirectional printer sharing capabilities between NetWare and OSF-1-based printers.

Novell customers have long had the need for more powerful, Unix-based servers. Most have turned to Novell's NetWare for Unix product, but it lacks the performance benefits of native NetWare.

Novell is expected to solve the performance problem itself later this year with the release of Processor Independent NetWare — new versions of native NetWare designed to run on Unix-based platforms, including Alpha.

"SoftNet Utilities' performance on Digital Alpha platforms rivals native NetWare on fast PCs," explained James Leslie of Puzzle Systems.

PERFORMANCE

In the meantime, SoftNet Utilities can help overcome performance limitations.

"SoftNet Utilities' performance on Digital Alpha platforms rivals native NetWare on fast PCs," explained James Leslie, co-founder and director of marketing at Puzzle Systems, based here.

"The Digital Alpha platforms are ideal hardware vehicles providing transparent OSF-1/Unix/Novell interoperability without performance degradation," he said.

SoftNet Utilities is available now. It is priced at $1,299, $1,999, $2,999, $3,999 and $5,499 for 16-, 32-, 64-, 100- and 250-user licenses, respectively.

✆Puzzle: (408) 779-9909.

CeBIT

Continued from page 21

Joe Uniejewski, director of marketing at Clariion, said the Windows NT implementation of the disk array products will ship in 60 days. Prices range from $19,100 for the low-end Series 1000 Model 1100 with 3G bytes of storage to $54,000 for the 20G-byte mid-range Series 2000 Model 2200.

David Cappuccio, program director of local-area services at Gartner Group, Inc., a market research firm in Stamford, Conn., said Windows NT support is not likely to make users flock to the Clariion line. Cappuccio explained that most Windows NT users elect to use the Redundant Array of Inexpensive Disks Level 5 support, which is built into the operating system.

"If they didn't want to tax the server with this software implementation, users might turn to Clariion for a hardware-only solution. But I don't think this will produce a lot of revenue for Clariion. The [Windows NT] market is not that big right now," he said.

DG also announced that it has doubled the capacity of it Series 4000 Model 4300 tape array subsystems by incorporating DDS-2 tape drives that compress data stored on the tapes.

The new Model 4300 can accommodate as many as seven 4mm digital audio tape drives, each with up to 8G bytes of storage using the DDS-2 data compression. The Model 4300 can be used for unattended backup for applications as large as 48G bytes.

The Model 4300 will ship within 60 days and is available in either a desktop or rack-mountable enclosure. Pricing starts at $19,000 for a unit with five drives.

✆DG: (800) 328-2436.

DG on a hardware roll

Company announces new servers, RAID and tape backup hardware at CeBIT trade show.

The AViiON 4500 — Priced at less than $10,000, the Unix-based product is positioned as DG's lowest cost enterprise server.

AV Cluster — Can tie together 4 Unix-based servers into a single superserver that can perform batch file transfers, on-line transactions, software upgrades and maintenance activities simultaneously.

Clariion RAID systems — In May, the RAID-based storage systems will be upgraded to support NT.

Clariion Series 4000 Model 4300 tape array — Will double the capacity and speed of DG's existing tape array subsystems.

Intel

Continued from page 21

only supported DOS environments, Version 2.0 of Traffic Analyst adds support for Windows. The application can also be integrated with Intel's personal computer-based LANDesk Manager net management application that handles desktop systems, servers and network services on NetWare LANs.

Intel has greatly improved the software's ability to capture packets and handle protocol decodes. The company also rolled out a built-in protocol compiler for Traffic Analyst that allows users to create customized packet filtering specifications based on user-defined or default criteria for rare or proprietary protocols.

These new filtering and packet capture enhancements are the most valuable for Jim Naught, PC network integrator at Electronic Testing Systems, Inc. (ETS) in Kensington, Pa. "The previous capture and filtering capabilities had several limitations that this upgrade fixes," he said. "Traffic Analyst not only allows me to capture more packets, but also lets me view, edit and retransmit the packet data. That has significantly enhanced our ability to test and monitor our network.

"We looked at alternatives such as LANalyzer, but that was simply too expensive for us to absorb," Naught added. "Traffic Analyst performs the same functions but at a much more palatable price."

Intel will also offer users an integrated net management package that includes OpenView for Windows 7.1 bundled with its LANDesk Manager 1.51 and LANDesk Manager SNMP Gateway 1.5 software applications. SNMP Gateway is a software package that passes Management Information Base data and network alarms between LANDesk Manager and OpenView via the Simple Network Management Protocol.

✆Intel: (800) 538-3373.

Printer firms push for management standard

Group set to establish SNMP MIB for printers.

BY CHRISTINE BURNS

A group of printer manufacturers led by Hewlett-Packard Co. is poised to propose an industry-standard Management Information Base (MIB) for handling networked printers.

A standard printer MIB would let systems administrators manage printers in an enterprise network via existing Simple Network Management Protocol-based management platforms such as HP OpenView, IBM NetView or Sun Microsystems, Inc. SunNet Manager.

"There are network management utilities that let users control their printers, but they typically only manage one kind of device," said Christopher Vasko, a consultant with BIS Strategic Decisions in Norwell, Mass.

"So if a network manager wants to manage all of his printers, he's running more than one application," he added.

And that's on top of the systems management platform he may be running to control the routers, hubs, servers, etc. in the enterprise."

Vasko said the industry has been slow to offer SNMP manageability of printers because until 18 months ago, most printers were attached to networks via a server and were not managed by themselves. Two-thirds of the installed base of printers are still attached to servers.

"Last year, there was an explosion of printers being directly connected to the network and, without a server there to buffer how the device is managed, users are calling for ways to control their printers directly," he said.

MIB SPECIFICS

Approximately a dozen companies have formed a working group that will present a proposal to the Internet Engineering Task Force (IETF) in May or June defining consistent management capabilities across network printers (see graphic). HP officials expect a ruling on the proposal by the end of the summer.

According to Keith Brown, product-line manager of HP's net printing division in Boise, Idaho, the MIB will provide: a standard means of bidirectional communication between printing devices and management applications; a common interface for status and control information; and a set of common information elements about the printer.

The MIB will make it possible to detect paper jams or lack of toner and collect basic information about the device, such as how it is connected to the network and whether it is a laser or ink jet printer.

NOT A DONE DEAL

Angel Boyd, director of printer research at International Data Corp., a research firm in Framingham, Mass., said while it will be relatively easy for printer manufacturers to support this MIB, application developers and network operating systems vendors must also buy into it. "While this is an important step, it's only the first one," she said. "By no means is the beauty of this going to be available to users."

Firms like Microsoft Corp. and Novell, Inc. need to take advantage of the information in the MIB. "Even if that happens quickly, the whole installed base isn't going to turn over overnight," Boyd said. "There are still going to be a lot of old printers and old management applications whose existence could hinder the widespread use of these capabilities."

Boyd added that there is also an issue of how networked printers and those attached to the net via a personal computer or server can be managed.

Management of the latter is being addressed by the Desktop Management Task Force. That body has outlined a Management Information File (MIF), which is a database of status and command objects particular to a desktop device.

According to Brown, the same printer working group proposing the MIB to the IETF is also working on a compatible standard-printer MIF.

Managing your printers

Manufacturers proposing a MIB standard for printers include:

- Adobe Systems, Inc.
- Digital
- HP
- Intel
- Lexmark Corp.
- Pennant, Inc.
- Tektronix, Inc.
- TI
- Xerox

Comments?

See "Contacts" box on page 2.

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NET RESULTS

by Mark Gibbs

How green is the net machine?

I was reading an article the other day that discussed the Environmental Protection Agency's Energy Star program.

The EPA estimates that as much as 5% of the nation's energy consumption is due to PCs. Since the average PC is only used for less than half the time it is on, there is a tremendous opportunity to save money, as well as the resources it takes to generate power and the pollution that comes from that generation process.



The Energy Star program is designed to encourage computer vendors to develop PCs that consume less energy. To give this program some teeth, it has been backed by an executive order from the president that requires government agencies to give Energy Star-compliant products primary consideration for new purchases.

So let's consider what Energy Star compliance implies in a network of say 1,000 PCs excluding file servers (which might add 30 computers to the count, but who wants to turn those beasts off?).

The power consumption of a PC is around 30 to 35 watts for the computer part and another 80 watts for the average 14-inch monitor. So the 1,000-node network with all PCs switched on is sucking up around 115 kilowatts. At 19 cents per kilowatt hour that is $21.85 per hour to keep all the PCs on the network running. Now that doesn't sound like much, but when you look at an annual figure, a much more interesting story emerges.

If, on average, the PCs are powered up for eight hours each day of a 220-day working year, the organization is forking out almost $38,456 per year to keep them all running.

If the PCs were to meet the EPA's Energy Star criteria, the monitor and the CPU would each power down to standby mode when switched on but not in use for, say, five minutes. To meet the Energy Star criteria, they must consume no more than 30 watts in this state. This would mean that if users, on average, actively used their Energy Star-compliant PCs for 30% of the working day (that's just under 2.5 hours per day) but left them switched on for a total of eight hours, the power cost for our 1,000-node network would drop to just over $25,500 a year.

Sounds good, doesn't it? But it may not be as good a business argument as it sounds.

There is a school of thought that says that leaving PCs running continuously is better than powering them off and on repeatedly. According to this school, the effects of thermal shock on integrated circuits — forcing all those submicroscopic structures to expand and contract — and the mechanical stress on hard disk drives means a shorter mean time between PC failures. If this is true, then there must be some point at which the cost of replacing the failed hardware and the savings on electricity charges cross over. Unfortunately, such figures don't seem to exist. And that's only the tip of the environmental iceberg. The coincidental costs of disposing of the failed PCs, the cost of cleaning up after generating the power to keep the PCs running and the cost of building the technically more advanced Energy Star-compliant systems need to be examined in detail.

I'd like to see PC vendors analyze the issue so a program like Energy Star can be seen from a rational business perspective and not from some dimensionless, gung ho, pseudoradical approach to environmentalism that may well be fundamentally wrong when viewed in a broader perspective.

Even more important, the PC business needs to take the lead. It needs to develop an environmentally ethical approach so business can buy into programs like Energy Star.

As network managers, you hold a tremendous amount of power to get the environmental ball rolling. Now is the time to start asking vendors tough questions and pushing for answers. We stand to not only save a few bucks, but we might just get a cleaner planet, as well.

Mark Gibbs is a consultant and writer based in Ventura, Calif. To comment, call him at (805) 647-2307 or E-mail him on the Internet at mgibbs@rain.org or on CompuServe at mhs:mgibbs@gyre.

Origen

Continued from page 21

servers with a single command," said Jack Surfass, president of PSI, based here. "Before, you could hit a single button for configuration, but you could only configure one server at a time."

INDIVIDUAL RIGHTS

Another enhancement in Origen 4 lets administrators distribute print-job configurations. Surfass explained that today, each user added to the net has individual rights with regard to each printer — such as which paper or form that user can print on — and that information has to be entered manually.

Origen 4 lets the administrator set these parameters across all network users or even across groups of users in particular departments.

The new software also lets administrators restrict disk access by group rather than individually.

Before this release, the administrator could limit users to a maximum of 5M bytes of memory on the server, but the information had to be entered for each user.

Finally, Origen 4 can now also run on an IBM OS/2-based machine.

Origen 4 is available now at $595 per server, $100 more than Origen 3. But those customers that bought Origen this year will be able to upgrade to the new version for free.

✆PSI: (203) 937-3000.

Comments?

See "Contacts" box on page 2.

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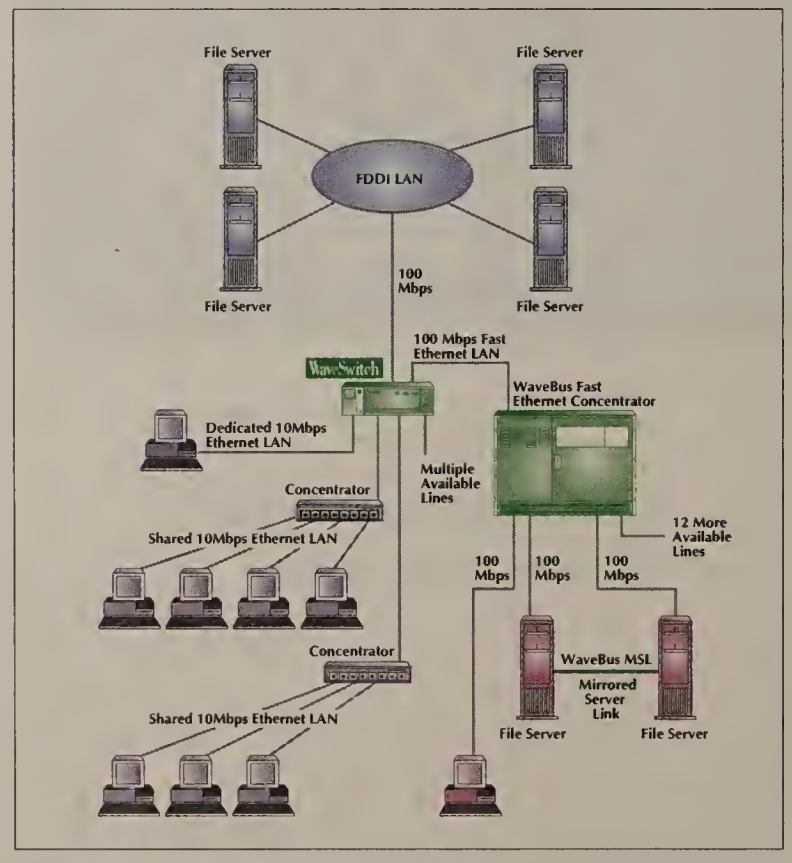
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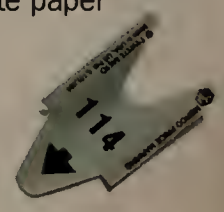
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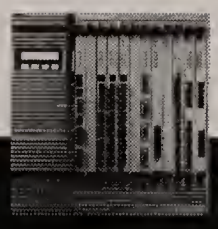
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BRIEFS

Starting in May, **Infonet Services Corp.** in El Segundo, Calif., will provide remote local-area net access over Integrated Services Digital Network lines using dial-up routers from **Telebit Corp.** in Sunnyvale, Calif. Telebit's NetBlazer routers offer LAN-to-LAN routing for smaller corporate offices and client-to-LAN access for individual and traveling employees. Using Infonet's InfoLAN Service, the value-added net provider will purchase and configure the NetBlazer routers and charge a monthly fee.

President Clinton last week nominated another Washington, D.C. telecommunications lawyer to the **Federal Communications Commission. Susan Ness** served for almost a decade as senior lender and group head in the Communications Industries Division of American Security Bank in Washington, D.C.

A laboratory where developers can **create wireless applications** and test compatibility and reliability will open April 1, according to the **Center for Software Development,** a joint effort of the City of San Jose, Novell, Inc. and the Software Entrepreneurs Forum. The center said it has created the Mobile Computing Lab, sponsored by AT&T, GTE Personal Communications Services, Hughes Network Systems, Motorola, Inc. and Novell, which will be equipped to allow developers to test their software running over the gamut of wireless technologies.

McCaw Cellular Communications, Inc. Chairman Craig McCaw was unable to make a splash with the firm's emerging **Cellular Digital Packet Data (CDPD)** technology at a lunchtime demonstration at the recent Mobile '94 conference in San Jose, Calif. The demo attempted to display data being exchanged between two laptops via CDPD, a digital wireless networking scheme by which data efficiently rides in the empty spaces within voice conversations. The culprit was said to be an unplugged VGA converter.

Meanwhile, Chairman McCaw acknowledged the firm's CDPD implementation delays — it was to be deployed in all its markets by June — but said the company will catch up to its schedule by the end of the year.

The **Canadian Radio, Television and Telecommunications Commission** approved introduction of a national 900 telephone service, but without automatic billing to phone numbers. To prevent abuse, the national pay-per-call numbers will require credit card billing or prepayment.

Starting next month, **Octel Communications Corp.** in Milpitas, Calif., will offer a personal computer-based voice processing product to give customers running OS/2 and Octel networking software the ability to send voice messages among locations worldwide. Using the $11,200-and-up Call Performer Plus, users with remote and branch offices will be able to send voice messages to any other subscriber with an Octel system by spelling the subscriber's name on the telephone keypad.

Wireless users move beyond messaging

BY JOANIE WEXLER

San Jose, Calif.

Many early wireless network users and would-be implementors at the recent Mobile '94 conference here were looking beyond simple messaging to the next phase of wireless communications: database access.

Timothy Titus, vice president of corporate development at F.D. Titus & Son, Inc., a medical products supplier in City of Industry, Calif., told a session group that his firm intends to roll out personal communicators this summer so his sales representatives can use wireless services to pull product and inventory information from the firm's Application System/400-based database.



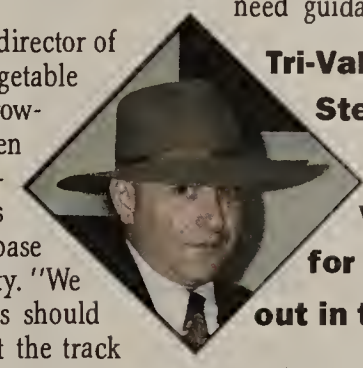
"We don't really care if it's TDMA, CDMA or CDPD as long as it works."

-Phillip Evans

Titus said his company has not yet selected a service provider, but his criteria is simply that the network be invisible to the user and "have a bigger data pipe" than is currently available from packet radio and cellular nets, which max out at 19.2K bit/sec.

Hatten Caine, the company's vice president of information systems, agreed. "RAM [Mobile Data] and ARDIS [Co.] are great for uploading orders, but downloading information on the fly is too slow."

Meanwhile, Stewart Bodzin, director of MIS net services at fruit and vegetable canning company Tri-Valley Growers in San Francisco, hasn't gotten started with wireless but envisions Tri-Valley crop inspectors out in fields using wireless database access to improve product quality. "We could determine which growers should pick peaches first by looking at the track record of a particular grower or the historical performance of a piece of land," he said.



Tri-Valley Growers' Stewart Bodzin: He's pondering wireless networks for crop inspectors out in the fields.

The employee in the field could also enter data into the host for future analysis, Bodzin said. Currently, without access to electricity, inspectors have no way to do this.

Tri-Valley, though, has discovered an unanticipated mobile computing glitch: The super-VGA client/server applications developed to run on desktops in-house will not work on notebook computers. So the firm might have to rewrite the client side of its applications for field use, Bodzin said.

Graceann Dieterich, systems manager of application development at Avis Rent-A-Car System, Inc. in Garden City, N.Y., noted that technology alone doesn't guarantee wireless application success.

The ARDIS wireless network has allowed airport shuttle bus drivers to input Preferred Service Customer information as the customer boards the bus; the system at headquarters prepares the rental contract and delivers the car location and information to the driver. "But from a business perspective, you can't take for granted that applications can be rolled out the same in all locations," Dieterich said.

The wireless version of Avis' Wizard reservation and information system — Wizard on Wheels — did not pan out at the John F. Kennedy International Airport in New York, which caters to international customers who are typically not in a hurry and may need guidance. Faster service presented no business benefit, and the system was removed.

Dieterich also said that so many Preferred Service Customers signed on — the number doubled during the first year using Wizard on Wheels — that the driver keying in each customer's information became a bottleneck. She indicated that a system may be coming that allows customers to swipe their Avis cards to speed transactions.

Like Titus and Dieterich, other users at the show seemed more concerned with the basics — coverage and reliability — than the ins and outs of any given wireless technology. "It's the service that matters, not the technology," said Phillip Evans, director of telecommunications at Perot Systems Corp. in Dallas. "While it's interesting, we don't really care if it's TDMA, CDMA or CDPD as long as it works."

Case in point: United Parcel Service, Inc. "ARDIS and RAM seemed technically suit-

See **Wireless**, *page 30*

NETWORKING STANDARDS

ATM Forum to tackle key technical, service issues

BY BILL BURCH

Durham, N.C.

The ATM Forum will meet this week to discuss implementation agreements on key technical issues related to new service offerings, net management and other areas in an effort to promote interoperability among carriers' newly minted ATM services.

For users, the forum's services work may be the top item. The services group appears close to an implementation agreement that would allow users to renegotiate bandwidth and quality of service for an ATM connection on the fly, according to Dean Skidmore, the group's chairman.

For example, if a videoconferencing hookup didn't have a solid picture, a user could secure more bandwidth without breaking a connection.

The group is also trying to forge a specification that defines how to carry voice, video and data over ATM links with no loss of timing during transmission. The group is basing its work on Motion Picture Experts Group 2 coder/decoders, the image compression devices that will likely be running on either end of a multimedia ATM line.

Transmission of frame relay packets over ATM is another issue that will be on the table. To date, the group has reviewed the Frame Relay Forum's specification for tying together frame relay and ATM services by enabling ATM links to emulate frame relay circuits. The services group is also working on direct connection of ATM to frame relay without emulation.

ATM Forum meeting agenda

Enterprise Network Roundtable will gather members' comments for white paper to guide Forum implementation agreements.

Forum Signaling Group will consider service quality negotiation, narrowband ISDN compatibility, multipoint-to-multipoint links and group addressing.

Forum Services Group will work on MPEG2 support for multimedia, frame relay over ATM, Switched Multimegabit Data Service compatibility and ATM circuit emulation for allowing T-1 traffic to flow over ATM.

For net managers with heavy investments in such equipment as T-1 multiplexers, the services group's No. 1 item could be implementation agreements for emulation of T-1, E-1 and Nx64K bit/sec circuits. "If customers are going to move to ATM backbones, there better be a way they can preserve some of that equipment," Skidmore said.

Mary Spada, an analyst with Global

See **ATM Forum**, *page 30*

New hybrid database systems offering the best of both worlds

BY PETER LISKER

Combining relational and object-oriented technologies, new hybrid database management systems are emerging to support a growing range of multimedia and networked applications.

Embraced early on for their ease of use, relational database management systems have been tweaked and tuned throughout the years to offer improved performance in supporting transaction processing applications. While many relational DBMS are being rearchitected to support complex data types, such as images or stored voice messages, they are primarily characterized by the ability to retrieve small amounts of data quickly.



Current object-oriented databases, on the other hand, are not renowned for their raw transaction processing power. But they do offer the ability to handle complex data types stored as objects.

The hybrid object relational model — which is being pushed by a small group of vendors, including Montage Software, Inc. of Oakland, Calif. and UniSQL, Inc. of Austin, Texas — combines the strengths of both technologies.

"The ability of the new hybrid databases to combine the transaction processing capabilities of relational databases with the features of object-oriented databases to support multiple data types is a much better approach to solving today's application needs than basically tacking on object capabilities to relational databases," said Richard Finkelstein, president of Performance Computing, Inc. in Chicago.

Today's hybrid databases use SQL, which is the lingua franca for relational DBMS manipulation. SQL support is vital for acceptance in a world dominated by relational models and products, and to ensure compatibility with existing database systems.

One problem that object-oriented databases have faced in the marketplace has been poor or no support for the critical SQL component. Hybrid databases incorporate a true relational DBMS with added support for complex data types. That makes them useful for new multimedia applications that utilize different data types.

For example, a medical facility may want to store magnetic resonance images (MRI) in a database along with other, more common medical information such as a patient's name and address and the person's medical history.

Using a hybrid database in a networked environment, these complex sets of data could be shared among physicians at multiple sites, allowing consultations to take place in real time. A hybrid database could easily and efficiently manage the storage, retrieval and updating of such a file, treating the scanned MRI as an object linked to the patient's data.

Other applications that lend themselves to the hybrid model include design automation systems and geographic information systems.

Hybrid databases have been designed to support off-loading of processing to increasingly powerful network clients whenever possible. In addition, they have been optimized to use network bandwidth efficiently when moving around blocks of data.

"The importance of the network in future database systems cannot be overemphasized," said Al D'Andrea, director of sales and marketing for UniSQL. "Without the drastically improved bandwidth that we're seeing now, it would be impossible for users to take advantage of object-oriented technology that is at the heart of the hybrid database."

Relational DBMS vendors have realized the importance of dealing with multimedia data, as evidenced by recent product announcements by the major players for support of such items as images and voice.

In addition, all the key players in the relational market will soon have full object support included in their product families. The approaches to incorporating complex data support range from providing an adjunct to the database engine to actually rewriting the database engine itself.

In this confusing arena, the hybrid vendors hope to increase their market share by differentiating themselves from their relational and object-oriented rivals, as well as stressing the compatibility of their products with existing legacy and database systems.

For users, the ability to combine the performance characteristics of a relational database with the object-oriented databases' capability of handling large amounts of data may be a powerfully attractive lure.



Dharma makes promise to deliver non-SQL databases to SQL world

System integrates older databases with Oracle.

BY JIM DUFFY

Nashua, N.H.

Dharma Systems, Inc., a developer of database interoperability tools, recently brought out software that links databases in a plant floor manufacturing environment.

Called Dharma/SQL Access for Process Manufacturing Integration System (PROMIS), the software provides SQL interfaces for proprietary plant floor databases that enables them to share files with other SQL-compliant databases used in an enterprise.

Integrated plant floor management systems came about in the early 1980s to speed production and lower costs for complex manufacturing activities. These mostly proprietary systems were adopted prior to the advent of SQL databases.

Dharma's software lets users access plant floor management systems from a graphical user interface (GUI) on the same workstations used to access SQL databases holding accounting and inventory information, Dharma said.

PROMIS fosters interoperability not only with the SQL database, but with fourth-generation language and CASE tools used to develop SQL-compatible applications.

PROMIS includes a so-called interactive SQL processor, which accepts ad hoc queries from users and reports the results of the query in a user-defined format.

The product also provides an embedded SQL processor, which allows users to develop portable database applications with embedded SQL statements, and a SQL application program interface that lets fourth-generation language and CASE tools interface with proprietary databases.

PROMIS fosters interoperability with fourth-generation language and CASE tools used to develop SQL-compatible applications.

Motorola, Inc. is using PROMIS to open up the plant floor management systems at its semiconductor manufacturing facilities in Austin, Texas, and Phoenix. That system is based on Digital Equipment Corp.'s RMS databases.

Users at the Austin wafer fabrication plant were having trouble analyzing the manufacturing data from their workstation GUIs to check for defects in the production process.

At first, the company tried downloading RMS files to an Oracle database, but that did n't help much because the data transfer was a batch oriented process that took five hours.

Motorola decided that the best solution to the problem would be to provide on-line SQL access to RMS data.

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Conferencing

Continued from page 31

saging infrastructure or install new gateways to run the software, Hahn said.

Hahn said the software will not be marketed as a direct competitor to Lotus Development Corp.'s Notes. For example, unlike Notes, Collabra Share is not designed as a platform for work flow applications.

However, Collabra is also planning software that will let Notes and Collabra Share users participate in the same desktop conferences, he said. This would let a company buy Notes only for workers who need work flow or other more sophisticated features, while using Collabra Share for those end users who only want access to conferences and shared information, he said.

"It's a very positive use of existing E-mail," said Chuck Stegman, principal analyst at market research firm Dataquest, Inc. in San Jose, Calif. "Information-centric companies will find it an interesting option."

However, Jim Bair, a senior analyst at New Science Associates, a San Mateo, Calif.-based consulting firm, said he would think twice before using Collabra Share or any LAN E-mail-based application to support mission-critical information. LAN-based E-mail products have yet to show the same sort of reliability found on host-based systems, he said.

"Can Collabra do real work, or should we save it for planning the company picnic?" Bair asked.

Pricing starts at $699.50 for a 10-user license. Server licenses start at $899.

✆Collabra: (415) 940-6400.

Editorial

The computer industry has always been exempt from rules that govern other industries. For example, software vendors have been able to get away with shipping products that don't work.

This week, users of Cheyenne Software, Inc.'s ARCserve 5.01 backup product will receive, free of charge, updates to their software. The first release, which many customers expected to use to back up their entire Novell, Inc. NetWare 4.0-based enterprise net, didn't work, and users spoke out (*NW*, March 14, page 4).

For years, vendors have been rushing products to market just to say they have something out there. That's probably the reason Cheyenne's product was so buggy — the company tried to be the first out the door with software that could back up NetWare 4.0 nets. As a result, most users fully expect to run any software they buy in a test server environment before running it in production mode.

But times, and applications, are changing.

First, budgets are shrinking and networks are growing. Fewer users have the facilities or the cash to run test networks, and fewer administrators have the time. People turn down opportunities to be beta sites for a reason.

Second, applications are becoming more complex and being put on more business-critical nets. When a majority of applications were word processing packages sitting on five-node NetWare 2.15 LANs, it wasn't so terrible for that software to fail, or even crash the server every now and then.

But when users buy a product like Cheyenne's ARCserve, or even NetWare 4.0 — which had its share of bugs — there's very little margin for error or server crashes. These are high-end products sitting on 1,000-node networks that are running the applications that run the business.

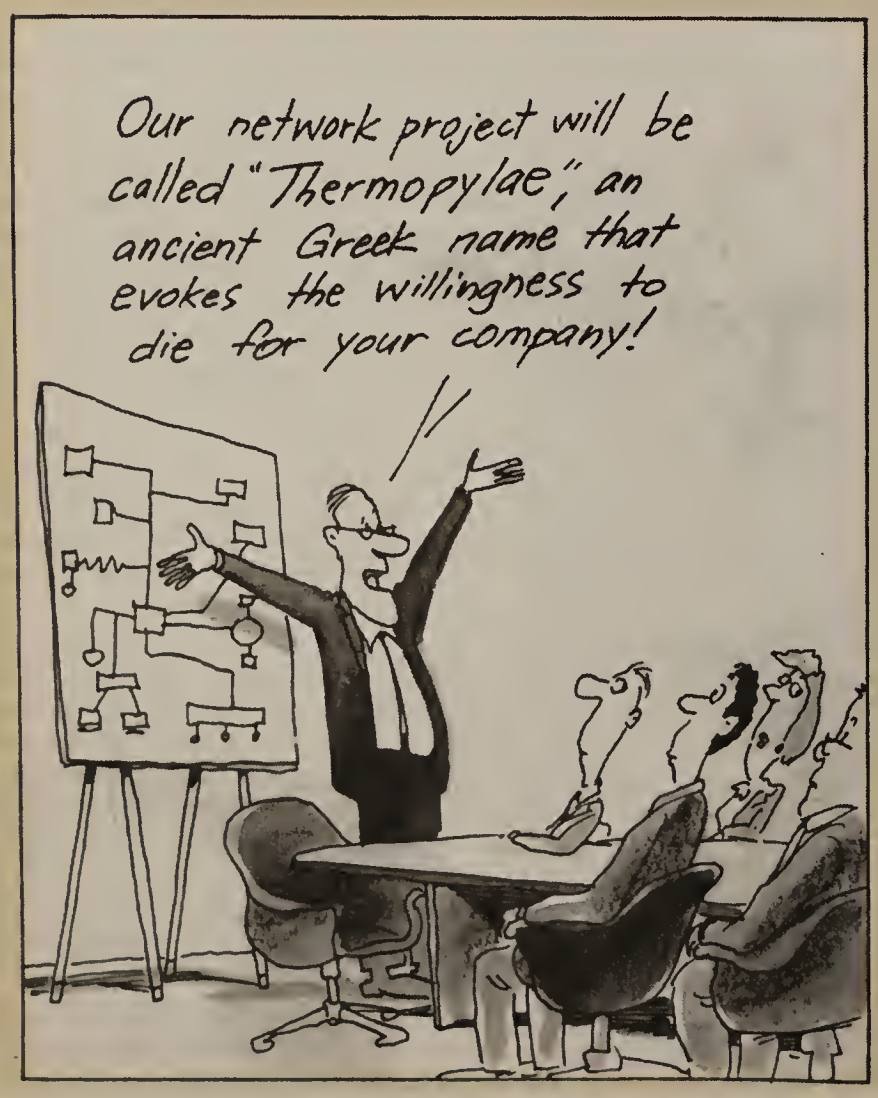
Novell may be on the right track. Last week, the company announced it will delay release of NetWare 4.1 until the end of the year, although it was initially set to ship this summer (*NW*, March 14, page 8). According to company executives, customers said they wanted more in the product than Novell planned to provide. Some users said the features originally slated to be included in NetWare 4.1 didn't provide enough incentive to upgrade.

Let's see other software companies take Novell's lead. If a product doesn't work, or if users in the beta program think the product needs more features or functionality, take it back and get it right. We'll wait.

➺CARYN GILLOOLY cgillool@world.std.com

TELETOONS

FRANK AND TROISE



NETWORK CONVERGENCE

by Mary Johnston Turner

LEC support of SNMP fills public network black hole

For network managers who previously wrote off public data network solutions as being unmanageable "black holes" and therefore not appropriate for supporting mission-critical applications, it's time to look again. New local exchange carrier (LEC) services supporting the Simple Network Management Protocol will have the potential to revolutionize the way users manage their public and private LAN/WAN internetworks.

In the coming months, most LECs will introduce the first phase of SNMP management for frame relay and Switched Multimegabit Data Service (SMDS). SNMP management for Asynchronous Transfer Mode (ATM) services is promised for 1995-96.



Is this news? SNMP has long been de rigueur for management of local-area networks, routers, hubs and related premises data networking equipment. Interexchange carriers (IXC) such as AT&T and MCI Communications Corp. have provided SNMP management using customized enterprise Management Information Bases (MIB) for frame relay since early last year.

Rather than publish customized MIBs, the LECs have generally opted to adopt recommendations made by the Frame Relay Forum and the SMDS Interest Group, with some enhancements recommended by the Bellcore Customer Network Management specification.

As a result, companies subscribing to frame relay or SMDS from several LECs are likely to have access to nearly identical management capabilities across the board. The general availability of LEC-supported SNMP management services means that customers can now have full end-to-end visibility into all components of their wide-area networks. The promise exists for customers to be able to manage services from multiple carriers using the same management platforms and software.

The initial LEC forays into SNMP management are modest, geared toward status reporting of utilization, configuration and problem reporting. Statistics such as number of frames eligible for discard or number of packets sent and received will be reported in 15-minute increments. Configuration status of the customer's service will also be available, as will near real-time reporting of alarms. Most LECs are planning to allow customers to view management data through private enterprise and SNMP management platforms or to receive printed reports on a monthly basis. None are planning to require customers to use a proprietary management workstation.

These performance and configuration status reports, whether near real-time or monthly, will allow both the carrier and the customer to be more proactive about planning for capacity and reconfiguration of the network.

Utilization pattern analysis and comparison of historical performance data will indicate when the network is reaching peak capacity and is due for an upgrade, before end users see degradation of service. For many customers long used to monitoring each device in a private network, SNMP messages from the public network will provide an important sense of assurance that everything is all right and the network is performing as it should on an end-to-end basis.

However, these initial capabilities, while in demand by many users, are limited to "view-only" — that is, the customer cannot directly modify the network at will or get information about performance at the network node level. Rather, configuration change requests or trouble-ticket reports must be manually entered into the carrier's change management system, often by means of a phone call to the carrier network control center.

By late this year or early next year, most LECs intend to allow the customer a greater amount of hands-on control, including the ability to request configuration changes in real time.

Further in the future is the promise of SNMP Version 2 (SNMPv2), a more secure and robust upgrade to the protocol, which will allow greater flexibility in terms of how data is reported to management workstations. Pacific Bell is committed to using SNMPv2 to support the validation and authorization capabilities associated with customer-controlled reconfiguration services it promises to offer in 1995. Other carriers are still developing SNMPv2 rollout plans, but all agree that as the management platforms and applications come to support SNMPv2, carrier services will keep up-to-date with SNMPv2 development as well.

Carriers report that the size and complexity of frame relay networks have exploded in the last six months. Interest in SMDS and ATM is high, as well. With the rise in complexity, the need for management also increases. Most carriers expect that 50% to 75% of frame relay and SMDS customers will ultimately purchase SNMP management services. Expectations for SNMP management for carriers' ATM offerings are also strong, although those services are still being developed.

Widespread availability of manageable public data network services is a critical crossover point for network planners. It signals that frame relay and SMDS have transitioned from being experimental to being operational services. With the end-to-end availability of standard management protocols and management services, it becomes reasonable to construct a mission-critical data network architecture based on a large proportion of public services. Just as voice networks have largely migrated onto public virtual networks, data networks will make the transition to public services equipped with adequate management tools.

By shifting more of the network infrastructure (for example, circuits, switches and intermediate routers) to the carrier, users have an opportunity to provision networks dynamically and flexibly to accommodate the needs of their organization as flexibly as possible. As standards-based management tools become more real-time and allow the customer greater hands-on control, the need for maintaining large-scale private networks decreases.

It's taken awhile, but the LECs are finally joining the SNMP party. For users, this means that the goal of seamless management across private, local and long-haul data networks is in reach.

➺Turner is a principal with Northeast Consulting Resources, Inc., a Boston-based consulting company. She can be reached at (617) 654-0619 or via the Internet at turner@ncri.com.

FEDERAL INTERNETWORKING

by Gary Workman

Charter violation makes FIRP report an exercise in government waste

The recommendations contained in the Federal Internetworking Requirements Panel (FIRP) draft report do not deserve the publicity they have generated (*NW*, Jan. 17, page 1; Jan. 24, pages 9 and 18). The panel members blatantly superseded the roles and responsibilities outlined for them in their charter. The panel simply does not have the authority to make the recommendations that were made.

A copy of the FIRP charter is contained in the appendix to the draft report. The introduction to the charter states: "The panel will study issues and recommend actions which the federal government can take to address the short- and long-term issues of interworking and convergence of networking protocols — particularly the Internet Protocol suite and the Open Systems Interconnection protocol suite, and where appropriate, proprietary protocols."

The charter states that the panel is authorized to make recommendations in the following areas:

- Feasibility of alternative scenarios for coexistence, interoperability and convergence between the IP and OSI suites;
- Expected cost and impact to mission of agencies if alternative scenarios are implemented;
- Process to be followed in obtaining advanced government requirements and in using federal investments in research, development and infrastructure to best effect federal requirements;
- Source of specifications for the Federal Information Processing Standards (FIPS), which are mandated in government procurement of information processing equipment;
- Testing requirements for FIPS (conformance and/or interoperability); and
- Procurement and deployment scenarios.

In addition, the charter states that "the panel is also encouraged to identify and describe policy and regulatory issues that believes need to be addressed but are beyond its purview."

Instead, the panel chose to blatantly exceed its charter authority. The summary to the FIRP report introduction states: "It is appropriate to review the entire strategy of meeting federal government internetworking requirements, rather than focus on the single issue of IP 'versus' GOSIP." The report then goes on to make five recommendations:

- The role of oversight and integration across federal agency internetworking activities should be strengthened within the Office of Management and Budget.
- The roles and responsibilities for fostering standards and assessing technological change should be refocused and strengthened by the Department of Commerce.
- The roles and responsibilities for infrastructure development and operations to support all internetworking services...should be clearly defined and formally assigned through the Information Infrastructure Task Force.
- The roles and responsibilities of affinity groups should be defined, including how they are created and coordinated by the Government Information Technology Services working group.
- Voluntary standards should be adopted and used by federal agencies, and international standards should be considered in the interest of promoting trade. The current GOSIP policy should be modified by the Commerce Department to reflect the wider range of international voluntary standards for internetworking.

The articles concerning the FIRP report should have stated that it contains recommendations the panel isn't authorized to make.

Clearly, these recommendations are beyond the scope of the panel's authority. That renders them meaningless, in my opinion. So why all the press? The articles concerning the FIRP report should have stated that it contains recommendations the panel isn't authorized to make.

Because the panel didn't do its job, no one in the federal government has been addressing OSI and IP interworking policy issues for the past five months.

The time the FIRP members spent discussing topics they shouldn't have while not discussing what they were supposed to is yet another example of government waste and abuse. That's the real story of the FIRP.

Workman is a staff development engineer with General Motors Corp. in Warren, Mich. He can be reached at (313) 947-0599.

Letters

Honest assessment

Congratulations on presenting a cogent, readable and honest assessment of a working piece of Asynchronous Transfer Mode (ATM) hardware (Feb. 21, page 37). Very refreshing in the midst of all the hyperbole, claims and counterclaims that seem to pass as news on this important (but so far, little understood) technology.

I was particularly interested in your efforts to explore the true capacity of the switch, as well as the illuminating report of the huge increase in buffer latency as capacity is reached. Also, I was quite interested in the effort to explain the three "flavors" of cells — constant bit rate, variable bit rate and available bit rate (ABR). In many applications, the "magic" offered by ATM marketers will not come to pass unless a much higher percentage of ABR traffic can be found than currently exists on many enterprise networks.



Hope to hear more as the market produces more "real" products for you to test.

David Starr
Communications specialist
Air Force Space Command LKO
Colorado Springs

Telecommuting not a cure

Regarding Douglas Welch's opinion column (Feb. 14, page 39), I have to respectfully disagree with the idea that telecommuting is the panacea that lots of folks make it out to be.

The manager has no idea what the employee is doing. Employees can log on, turn on the radio/TV/CD/tape player, hang out doing little (if anything), press the ENTER key occasionally, and it appears as if they are working. People working for large corporations or government need a "cattle prod" to function at a high level all the time. The prod is the boss being able to come in unexpectedly, just to see how things are progressing. And, if you need real proof, look at the downsizing that is going on within big companies. If all employees were hard-working, then there wouldn't be much need for cutting jobs.

Plus, when you are at work, you have instant access to all of the other people at work, who can provide answers to your questions. If you are not at work, you don't have access to the company "geniuses." Plus, if *you* are one of the geniuses and you are telecommuting, then you have lowered the productivity of all of the other workers.

About the only good uses of telecommuting are: (1) late-night on-call repairs, and (2) to do one or two days per week of coding when a project is in the coding phase. Other than that, it's a concept that's right up there with Piltdown man, cold fusion and global warming.

Don Farrar
Senior systems programmer
Sysorex International, Inc.
Martinez, Calif.

RSA not broken

In his letter to the editor (Feb. 14, page 51), Colin James III reports that Dr. Bill Payne has "broken" public-key encryption and notes that I have seen Payne's draft paper. I have, and Payne has not broken public-key encryption.

Payne's method, which attacks

See Letters, *page 36*

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Letters

Continued from page 35

the Rivest-Shamir-Adleman (RSA) encryption system, is extremely slow, taking as many operations as the value of the RSA key. If the RSA key is 200 digits long, a typical length, then Payne's method takes about 10^{200} operations. (This is more than astronomical.)

There are much better methods than Payne's for attacking RSA, yet no one considers any of those to "break" RSA in any sense of the word. So Payne's method, though simple and clever, is definitely not a break.

The details of Payne's method take slightly more space than this letter permits. I have posted a summary on the Internet and would be happy to send a copy to anyone who requests it.

Burt Kaliski
Chief scientist
RSA Laboratories
Redwood City, Calif.

Paging NMS

Mark Gibbs' review of Novell, Inc.'s NetWare Management System (NMS) 2.0 (Feb. 14, page 41) was, in my opinion, a fair assessment. One correction I would like to make involves the references to third-party support products.

It was stated that Compaq Computer Corp. has developed an add-on module that provides pager support.

This is misleading. While Compaq's Insight Manager does have paging support for its own devices, this functionality is neither monitored by NMS nor are the alarms reported to the NMS Alarm Manager. This type of paging capability can be found with Denmac Systems' AlertPage, a paging and dispatching application developed specifically for Novell's NMS. I just wanted to bring this to your attention.

Tim Lloyd
Product manager
Denmac Systems, Inc.
Northbrook, Ill.

Write-in candidate

I was surprised to see that your Enterprise Technology Awards ballot (Feb. 28, page 28) does not include a category for fax servers. While imaging systems and group collaboration software — which are included — are only being deployed at present by a small handful of technology innovators, computer fax systems are one of the fastest growing and most widely im-plemented products today. I hope you will include them in your future surveys.

Lenny Liebmann
Partner
IP&D
Highlands, N.J.

Out of tune

In his article "IBM unveils long-awaited APPN 3270 support along with net tuning products" (Jan. 24, page 16), Michael Cooney states that "NTuneNCP lets SNA users for the first time tune their SNA nets without having to take NCP down."

This statement is incorrect. The ability to tune Systems Network Architecture networks without having to take Network Control Program (NCP) down has been around since January 1993 with BMC Software's Opertune for NCP.

Opertune for NCP allows users to dynamically adjust up to 53 NCP parameters and control blocks — more than will be available with the NTuneNCP product.

In addition, the product provides tuning suggestions via both on-line and batch reporting functions, as well as statistical collection for resources such as Synchronous Data Link Control and Token-Ring lines, IBM 3X74 controllers and virtual routes. Opertune for NCP doesn't require the use of NetView or NCP Version 7.1.

BMC Software was the first to pioneer this marketplace and should be noted as such.

Cameron Haight
Networking software consultant
BMC Software, Inc.
Houston

Fact or fiction?

Regarding David Rohde's article "Users unfazed about collapse of Bell Atlantic/TCI merger" (Feb. 28, page 7):

I don't know if Vice President Gore is as ignorant of economics as he is of the environment or if he is just unable to differentiate between fact and fiction.

When he says, "These two companies were on the rocks," regarding Bell Atlantic Corp./Tele-Communications, Inc., he surprises a lot of people who subscribe to the *Wall Street Journal* and *Barron's*. And when he says, "The decision by the FCC will end up accelerating the Information Superhighway and will speed up developments the country wants to see," regarding the Federal Communications Commission decision, purported to be the reason behind the collapse, he's more perceptive than most people who wonder what the National Information Infrastructure hullabaloo is all about, other than more populist dumb flimflammery.

Tim Maguire
President
T.H. Maguire & Associates, Inc.
Fairfield, Conn.

Help desk

Continued from page 2

ers on Ethernet, Token-Ring or LocalTalk networks.

Macintosh and PC users must each have a copy of Timbuktu installed on their workstations to transfer files and share screens. Macintoshes must have System 6.05 or later to run Timbuktu for Macintosh, and some features require System 7. PCs must use MS-DOS 3.1 or later to run Timbuktu for Windows; however, MS-DOS 5.0 or later is recommended.

Another option, Timbuktu for Windows PhoneNET Kit, includes a LocalTalk interface card for an Industry Standard Architecture (ISA) or Micro Channel Architecture bus and a PhoneNET connector, a LocalTalk transceiver that attaches to an existing PhoneNET network.

On another front, you may want to check out Timbuktu's EtherWave Kit, a daisy-chainable 10Base-T Ethernet ISA card and RJ-45 cable for connecting a PC to a Macintosh 10Base-T Ethernet.

This includes an Ethernet ISA card, software and necessary cabling to connect to a 10Base-T network. Timbuktu prices range from $199 to $379. For more information, call (510) 814-5000.

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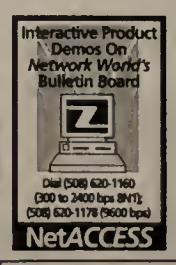
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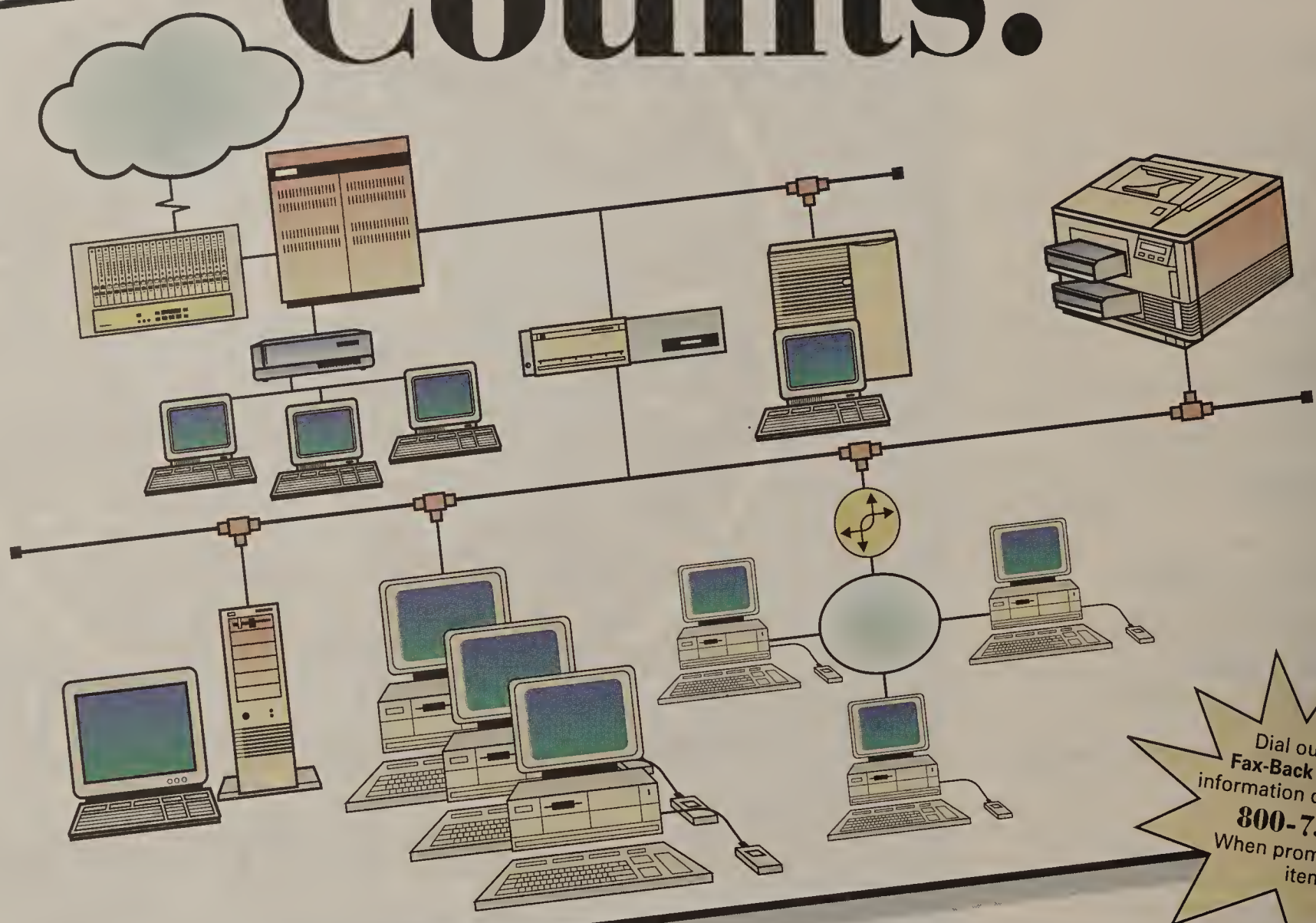
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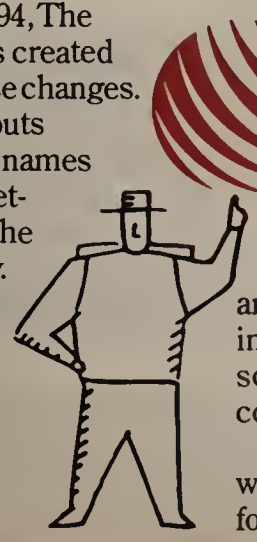
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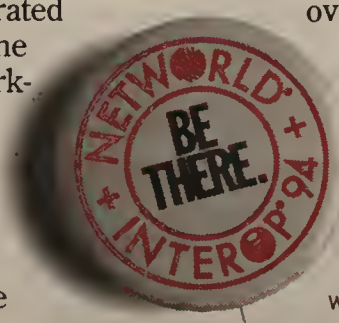


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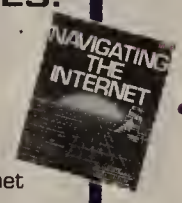
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Understanding Broadband Networks: Architectures, Protocols & Implementation

Buyer's guide

Wading through plethora of options poses challenge to users retooling for

Life on the *fast* LAN

BY MARK MILLER

As New York Yankee great Yogi Berra would say, this is "deja vu all over again." And indeed it is for network managers looking to bump up the speed of today's LANs to 100M bit/sec.

In looking to accommodate increased traffic or feed bandwidth-hungry applications, the decision net managers are up against now is little different than the one they dealt with just a few years ago. It's just that today there are more technical options for turbocharging local-area networks.

A few years ago, high-speed LAN choices were limited. In order to attain 100M bit/sec LAN speed, net managers pretty much had to choose between running Fiber Distributed Data Interface-over-fiber cable and emerging FDDI-over-copper options. Those choices carried high price tags, and there were no cast-iron guarantees that FDDI-over-fiber or -copper adapters from different vendors would work well together in the same network.

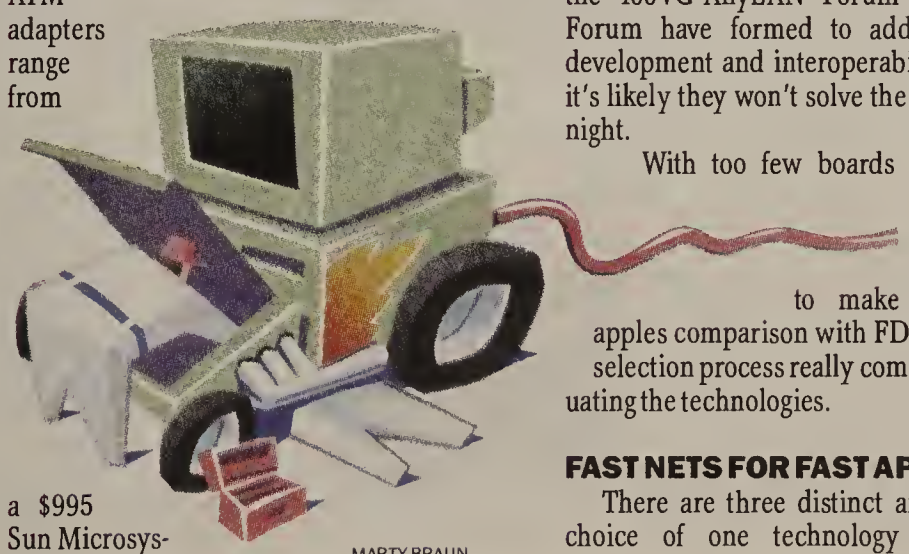
Today, there are several new options hitting the market. For instance, Asynchronous Transfer Mode (ATM) offers a mix of speeds from 25M to 622M bit/sec. There are two different 100Base-T offerings — 100Base-X and 4T+ — that will support 100M bit/sec Ethernet. There is also a 100VG-AnyLAN option that will provide 100M bit/sec Ethernet and 100M bit/sec token ring (see chart, page 44).

And FDDI-over-fiber and -copper technologies are more mature. FDDI remains expensive, however, with only eight of the 30 FDDI products or product families listed in the Buyer's Guide chart on page 46 coming in at under $1,000.

When all is said and done, the decision comes down now as it did then to weighing the need for 100M bit/sec speed against the high cost of pulling fiber cable and the risks of going with unproven technology.

Selecting from among the emerging technologies will be a difficult task because the ink is just drying on some of the standards documents, while others are still being written.

And there is a dearth of products that support these emerging standards. Only seven of the 17 vendors in the chart pledge support for ATM, and only three of those vendors are actually shipping products. Published prices for ATM adapters range from a $995 Sun Microsystems, Inc. offering that will use Category 5 unshielded twisted pair when it ships in the second quarter to a $3,995 Fore Systems, Inc. adapter that is currently available and uses fiber cable.



MARTY BRAUN

Grand Junction Networks, Inc. is the only vendor shipping a 100M bit/sec Ethernet adapter, its $399 FastNIC 100 EISA. That board is the company's implementation of a draft 100Base-T specification. Sun promises to deliver a 100Base-T board costing $795 in the second quarter.

Proteon, Inc. is the only vendor in the chart promising to deliver a 100VG-AnyLAN adapter. But the company has not set a price for it and says the product won't ship until the fourth quarter.

Information in the Buyer's Guide chart was compiled last month and reflects products that were announced at that time.

Because adapters supporting the emerging technology are so new or not yet shipping, net managers have the same interoperability woes they did a few years ago with FDDI. Vendor alliances such as the Fast Ethernet Alliance, the 100VG-AnyLAN Forum and the ATM Forum have formed to address standards development and interoperability issues, but it's likely they won't solve the problems overnight.

With too few boards supporting the emerging standards available to make an apples-to-apples comparison with FDDI feasible, the selection process really comes down to evaluating the technologies.

FAST NETS FOR FAST APPS

There are three distinct areas where the choice of one technology over another becomes clear, says Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C.

Support for isochronous communications makes ATM the leader of the pack for applications that require delivery of time-sensitive packets, he says. Applications requiring isochronous communications include voice, video and multimedia.

For users that have a mix of Ethernets and token rings today, the 100VG-AnyLAN solution is preferred since it provides a common path for users of both technologies to upgrade to 100M bit/sec, Dzubeck says.

Finally, if the requirement is to transfer large amounts of data, such as in a client/server environment, then Dzubeck recommends any one of the other alternatives, such as 100Base-T or FDDI.

Another key factor to consider is the cabling requirements of each alternative. Cabling deserves a big caveat emptor because when one form of twisted pair cable has been installed, net managers will have to live with that decision for many years — or pay a high price for a second chance at getting it right.

The most affordable cabling option is unshielded twisted pair. There are several different categories of this cable, as defined by ANSI, and each category has its own unique trait (see graphic, page 49).

But Category 5 unshielded twisted pair seems the best bet at this point, according to many analysts and users.

The price difference between Category 3 and Category 5 cable has shrunk to the point that it makes little sense to use Category 3 for new installations, according to Robert Fink, director of communications and networking at Lawrence Berkeley Laboratory (LBL) in Berkeley, Calif.

Fink estimates that the average cable runs at LBL are 50 meters in length and cost about $200 to install. Of that cost, about 75% goes toward labor. That labor cost is the same for Category 3 cable, leaving the cost of the cable and associated connectors making up the difference.

"Paying the 5% to 10% additional cost for installing Category 5 cable over Category 3 positions the network infrastructure for greater flexibility as new technologies become

Continued on page 44

1994 NETWORK WORLD SHORT LIST

100M bit/sec LAN options

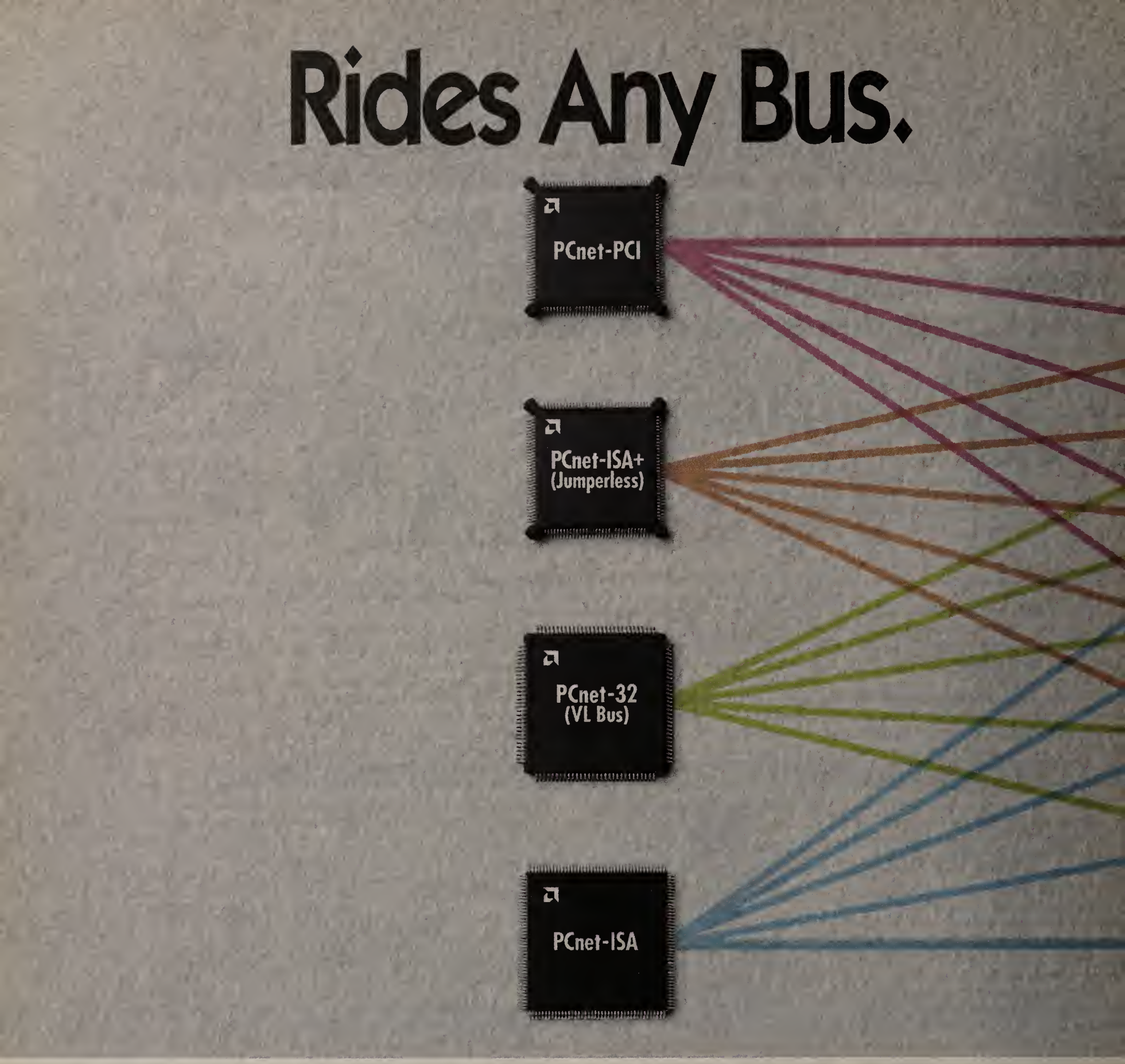
- **Cisco Systems, Inc.** *WorkGroup CDDI/FDDI Adapter family*
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- **Network Peripherals, Inc.** *NP FDDI Adapter family*
- **SysKonnect, Inc.** *SK-Net FDDI Series*
- **3Com Corp.** *FDDILink family*

Complete details about The Short List, including what to look for in emerging 100M bit/sec Ethernet, token-ring and ATM adapters, appear on page 47.

inside

- What to do to determine whether an upgrade is justified. Page 44.
- Chart compares the options. Page 44.
- Buyer's Guide chart lists the products. Page 46.
- Reader views on 100M bit/sec LAN options. Page 49.

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Continued from page 41

available," Fink says.

Al Reid, a telecommunications manager at an electric utility, agrees. He is preparing a migration to a 100M bit/sec LAN technology and is putting in Category 5 unshielded twisted pair for all new installations.

The reason is simple, Reid says. Each of the major 100M bit/sec LAN options will be able to run over the cable, thus leaving him the most flexibility in choosing a technology when the time comes to upgrade LAN speed.

Comparing the 100M bit/sec LAN options

Option	Media access control	Data rate (M bit/sec)	Cabling options/ number of twisted pairs	Standards setting body	Vendor forum
100Base-T (100Base-X physical layer)	CSMA/CD	100	Category 5 UTP/2; Types 1 and 2 STP/2;multimode fiber/NA	IEEE 802.3	Fast Ethernet Alliance
100Base-T (4T+ physical layer)	CSMA/CD	100	Categories 3, 4 and 5 UTP/4	IEEE 802.3	Fast Ethernet Alliance
100VG-AnyLAN	Demand Priority	100	Categories 3, 4 and 5 UTP/4	IEEE 802.12	100VG-AnyLAN Forum
FDDI	Token passing	100	Categories 3, 4 and 5 UTP/2, 4; Types 1 and 2 STP/2, 4; multimode, single-mode fiber/NA	ANSI X3T9.5	NA
ATM	Cell switching	25-622	Category 5 UTP/2, 4; Types 1 and 2 STP/2; multimode fiber/NA	ITU	ATM Forum

ATM = Asynchronous Transfer Mode
FDDI = Fiber Distributed Data Interface
ITU = International Telecommunication Union
NA = Not applicable
STP = Shielded twisted pair
UTP = Unshielded twisted pair

"We anticipate that traffic growth from our electronic data interchange, and CAD/CAM applications will require higher bandwidth on our local segments," Reid says. "When those demands justify the capital expenditures, our infrastructure will already be positioned for the conversion."

Shielded twisted-pair cable is well suited for sites that follow IBM's cabling plan. Shielded twisted pair was the first copper cable option that could support FDDI. But shielded twisted pair falls into the middle ground cost-wise.

Fiber remains an expensive option when compared to the alternatives. But among fiber's benefits are that it can be used with all the alternatives and it is immune to electrical interference.

Aside from the applications they support and the cabling requirements, each 100M bit/sec LAN alternative has unique attributes that will play a key role in picking one over the other.

ATM: THE NEW HOT ROD

ATM has been touted as the next revolution in networking. ATM switches 53-byte data cells between source and destination nodes over both local and wide areas. Its ability to operate over a range of speeds from 25M to 622M bit/sec makes it more scalable than the other alternatives.

To run on a LAN, ATM requires two principal components: an ATM switch and ATM interface cards in the attached devices such as servers or high-end workstations. The ATM LAN switches can have interfaces to WAN links that operate at 45M or 155M bit/sec and interconnect various ATM LANs.

While ATM offers greater speed than existing Ethernet and token-ring environments, its cell overhead makes it less appealing than the other 100M bit/sec options in supporting such desktop applications as file transfer, says Scott Haugdahl, managing engineer at Pine Mountain Group, Inc., a consultancy in Groveland, Calif.

Of each 53-byte cell, 5 bytes are consumed in overhead. Files being transferred have to be fragmented and reassembled, as well. For example, a file contained in one 4K-byte token-ring packet would result in just under 100 cells on an ATM LAN.

"For ATM to compete against other desktop technologies, it must provide greater than 100M bit/sec end-to-end throughput, plus fall between FDDI and fast Ethernet in cost," Haugdahl says. "We do not expect the economies of scale to favor ATM until 1996 or 1997."

Indeed, many network managers see ATM as the clear long-range solution. Ron Brown, LAN manager at Mobil Oil Corp. in Falls Church, Va., has seen rapid growth in the number of users connecting into the Internet and foresees greater bandwidth requirements in the immediate future.

"Our Internet traffic has doubled in the past six months and will probably double again by next year," he says. Rather than consider an immediate change from their existing bridged token-ring environment, however, Brown and his group are looking to ATM. "Our strategy is to move toward an ATM architecture; therefore, we evaluate new infrastructures with the long-term objective in mind."

Where ATM shines is in handling very large files, especially over wide areas at very high speeds. Image transfers — one of the most frequently touted ATM applications — is a reality on the Fiber Optic Islandwide Super High-speed Network (FISHnet), designed by Cablevision Systems Corp. of Woodbury, N.Y.

FISHnet links physicians and researchers at Brookhaven National Laboratory in Upton, N.Y., State University of New York at Stony Brook and Grumman Data Systems in Holtsville, N.Y., according to Rudy Welter, director of research and development at Cablevision.

A fiber backbone, operating at the Optical Carrier (OC)-3 rate of 155M bit/sec, connects Fore Systems ATM switches at each location. Sun workstations and host computers are linked to the ATM switches at 100M bit/sec via ATM adapters.

"Doctors at Stony Brook Hospital are able to see patient X-rays taken at Brookhaven and read those X-rays in essentially real time," Welter says. "If additional diagnostics are required, such as a slightly different X-ray position, it can be done immediately, while the patient is still in the X-ray room. This saves expenses for all involved and, hopefully, reduces health care costs."

The most distinguishing characteristics of ATM adapters are the bus structures they are designed to work with plus the cabling they support. For the most part, ATM adapters are made to work with buses that have high-speed I/O channels that make it possible for the device to offer up data as quickly as the ATM adapter can put it on the LAN.

Fore Systems has the broadest range of adapters, with each supporting fiber cable only. But adapters are available for a mix of high-power workstations from Digital Equipment Corp., Hewlett-Packard Co., Sun and Silicon Graphics, Inc. Products are also available for systems sporting the ever-popular Extended Industry Standard Architecture bus and VMEbus. Fore Systems' adapters use a 16K-byte buffer for data that is received from the network and a 4K-byte buffer for data being sent to the network.

Other vendors offer ATM adapters for specific workstations. Sun, for example, is designing its Sun ATM Adapter to plug into Sun SPARCstations running the Solaris operating system and to operate over multimode fiber or Category 5 unshielded twisted pair. Like most ATM adapters, the Sun ATM Adapter has 1M-byte of on-board memory for cell processing.

But with so few products available now, many network managers are holding off on selecting ATM.

David Marchus, senior technical planner at Texas Utilities Services, an electrical utility in north Texas, is waiting for product stability and lower prices before taking the plunge into ATM. The Texas Utilities network has a combination of Ethernet and token-ring topologies, supporting OS/2 LAN Server, Systems Network Architecture and X.25 protocols.

"As a public utility, we must justify our expenses," Marchus says. "If we are going to use ATM at the desktop, then it must be inexpensive. When we see the price of ATM adapters approach the price of token-ring adapters, we will be ready to go ATM end-to-end."

To prepare for this transition, Marchus and his group have joined the ATM Forum's user alliance, called the Enterprise Network RoundTable (ENR).

"We want to be in the information flow of the new standards and applications, and ENR helps us plan for our eventual migration to ATM," he says.

Hughes Aircraft Co. in El Segundo, Calif., is another company with ATM plans waiting in the wings. The firm has a large investment in traditional Ethernet but plans to skip the fast Ethernet products and adopt ATM to the desktop by late this year or early next year, says Bob Emmett, manager of network architecture at Hughes Aircraft.

Hughes Aircraft is conducting a field trial with Sprint Corp. and Pacific Bell to link Unix servers in three California sites and one Virginia location via wide-area ATM services. "The ATM trial on the WAN has been successful," Emmett says. "It has allowed us to measure performance and also forecast our costs."

Hughes Aircraft's next step is to extend ATM to the LAN, testing computer-aided design, desktop video and electronic messaging applications, but the firm anticipates a few

Continued on page 47

Justifying the high octane

There are a few relatively simple steps users can take to determine whether examining a costly upgrade of their local networks to 100M bit/sec speed would be justified to break traffic bottlenecks. Separating road hog applications from others on the net and ruling out redesigns to the existing LAN are just two of those steps. If those measures don't work, plotting out a clear migration strategy to higher speed will be needed.

Identifying road hog applications can be easy. Certain types of applications, such as computer-aided design and manufacturing, create large files that can drag net performance down. Yet, other types of applications, such as client/server database processing, can create lots of little files that can slow response time as they fly around the network.

"For most networks, the growth in total traffic volume — not in one single application — is the overriding concern," says Kathryn Korostoff, president of Sage Research, a consulting firm in Natick, Mass.

Korostoff's studies have identified two trends at the root of increasing traffic loads: a migration to client/server computing, which increases the net traffic into and out of servers, and the growing use of graphic-intensive applications, such as imaging, radiography and CAD/CAM.

Using a net management console or protocol analyzer, net managers can capture and subsequently examine data about the traffic generated by those applications. Collecting traffic data enables net managers to whip up historical usage charts that show volumes by protocol, the heaviest users of network bandwidth or the average and peak network utilization times.

If traffic flow is especially heavy during one period of the day, then limiting the number of applications that can be run during that time is an alternative. For example, putting off certain processing tasks currently run at the peak load time to low peak time may equalize bandwidth utilization over the entire day and postpone the need for a higher speed LAN.

For budget conscious net managers who can't afford to run applications at specific times, examining some LAN design changes may be in order. Korostoff says net managers can reduce the number of users assigned to existing LAN segments to reduce overall traffic load or break a large workgroup into smaller subnets. Both options would yield more bandwidth at little or no extra cost.

In environments where those approaches don't work, net managers will need to constantly reevaluate their existing LAN design as new technologies become available, says Michael DeFrenza, network planner at the National Aeronautics and Space Administration's Ames Research Center in Moffett Field, Calif.

The tremendous traffic volume generated by networked scientific modeling applications running on Cray Research, Inc. supercomputers has already forced the facility to migrate from a large Ethernet to routing Ethernet subnet traffic across a 100M bit/sec Fiber Distributed Data Interface backbone. DeFrenza says continued need for bandwidth is pushing him to start planning a move toward Asynchronous Transfer Mode.

"As our supercomputing applications increased two years ago, we started deploying FDDI," DeFrenza says. "With ATM now available, we plan to take another look at that network architecture."

M. Miller

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100M bit/sec LAN options

Company	Product	Adapter type: 100Base-T	100VG-AnyLAN	ATM	FDDI	TP-PMD	SDDI	Bus type supported (S = Sbus, T = Turbochannel, V = VMEbus, O = Other; E = EISA, I = ISA, M = Microchannel, N = NuBus)	Device board designed for: (M = Mainframe, MC = Minicomputer, R = Router, U = Unix-based workstation; B = Bridge, E = End node, H = Hub, L = LAN server)	On-board RAM (bytes)	Drivers supported: VINES	PC/TCP	OS/2 LAN Server	LAN Manager	NDIS	NETBEUI	NETBIOS	NetWare	ODI	PC NFS	Windows	Other	Diagnostic capabilities (A = Network activity LED, B = Link status LED)	Management agents supported: SNMP	SMT	Proprietary	Supports (BB = Bulletin board, T = Toll-free number)	Price/ Warranty (months)
ALFA, Inc. (908) 789-2068	A1000				✔	✔		I	E, L	128K		✔	✔	✔	✔			✔	✔	✔			B	✔	✔			$795-$995/18
	A1100 EISA FDDI Adapter				✔	✔		E	E, L	128K	✔	✔	✔	✔	✔			✔	✔	✔			B	✔	✔			$1,095-$1,295/18
	A1200 Sbus FDDI Adapter				✔	✔		S	L, U	128K												Solaris, SunOS	B	✔	✔			$995-$1,195/18
Cabletron Systems, Inc. (603) 332-9400	FDDI DNI Cards				✔	✔	✔	E, M, N	E, L, MC	1M	✔		✔		✔			✔	✔	✔		AppleTalk, AIX	A, B	✔	✔		BB	$1,495-$1,995/12
Cisco Systems, Inc. (800) 238-2334	WorkGroup CDDI/FDDI Sbus Adapter				✔	✔	✔	S	E, L, U	128K												Solaris, SunOS	A, B	✔	✔	✔	BB, T	$1,495-$2,995/3
	WorkGroup CDDI/FDDI MCA Adapter				✔	✔	✔	M	E, L, U	128K												AIX	A, B	✔	✔	✔	BB, T	$1,495-$3,390/3
	WorkGroup CDDI/FDDI EISA Adapter				✔	✔	✔	E	E, L, U	128K						✔	✔	✔	✔		✔		A, B	✔	✔	✔	BB, T	$1,195-$1,995/3
Digital Equipment Corp. (800) 344-4825	DGLTA (1)			✔				T	L, MC, U	512K												OpenVMS, OSF/1	B				T	(3)/12
	DEC FDDI Controller/Turbo Adapter				✔	✔		T	E, L, M, MC, U	1M												OpenVMS VAX&AXP, OSF/1 AXP, Ultrix VAX	B	✔	✔	✔	T	$1,350-$2,250/12
	DEC FDDI Controller/EISA				✔	✔		E	E, L, R, U	1M		✔		✔	✔	✔	✔	✔	✔			OSF, Pathworks, VMS	B	✔	✔		BB, T	$895-$2,500/12
	DEC FDDI Controller/Future Bus +				✔			O	E, L, M, MC, U	1M												OpenVMS VAX&AXP, OSF/1 AXP	B	✔	✔	✔	T	$8,295-$8,995/12
	DEC FDDI Controller 400				✔			O	E, L, M, MC	1M												OpenVMS VAX&AXP, OSF/1 AXP	B	✔	✔	✔	T	$17,910/12
	DEC FDDI Controller/Q-bus Adapter				✔			O	E, L, MC	1M												OpenVMS VAX	B	✔	✔	✔	T	$4,600-$6,300/12
Fore Systems, Inc. (412) 772-6600	SBA-200			✔				S	U	4K, 16K										✔		Solaris, SunOS	A, B	✔			BB, T	$2,495-$2,995/3
	ESA-200			✔				E	U	4K, 16K												IRIX	A, B	✔			BB, T	$2,495-$2,995/3
	HPA-200			✔				E, S, O	U	4K, 16K												HP-UX	A, B	✔			BB, T	$2,495-$2,995/3
	VMA-200			✔				V	U	4K, 16K												IRIX	A, B	✔			BB, T	$3,495-$3,995/3
	TCA-100			✔				T	U	4K, 16K												Ultrix	A, B	✔			BB, T	$2,995-$3,495/3
	GIA-100			✔				O	U	4K, 16K												IRIX	A, B	✔			BB, T	$2,995-$3,495/3
Grand Junction Networks, Inc. (800) 747-3278	FastNIC 100 EISA	✔						E	L	1M				✔	✔			✔	✔				A, B					$399/12
Hewlett-Packard Co. (800) 637-7740	HP FDDI/9000 for Series 800 Business Servers				✔			O	MC	32K				✔				✔				TCP/IP	A, B	✔	✔		T	$4,495/3
IBM (800) 426-2255	IBM FDDI Adapters				✔		✔	E, I, M	B, E, H, L, R, U	128K			✔	✔	✔	✔	✔	✔	✔			DR DOS, LAN support program, SCO Unix, DR DOS, TCP/IP	A, B	✔	✔		BB, T	$700-$1,700/60
Interphase Corp. (800) 327-8638	E/FDDI 4811 Sea Hawk				✔	✔	✔	E	L, M, MC, U													HP-UX	A, B		✔		T	$1,795-$3,295/12
	S/ATM 4615			✔				S	L, U	1M												Solaris, SunOS					T	$1,995/12
	S/FDDI 4611 SunBird				✔	✔	✔	S	L, M, MC, U													Solaris, SunOS		✔			T	$1,950-$2,295/12
	V/ATM 5215			✔				V	L, U	1M												Unix					T	$3,495/12
	V/FDDI 5211 Peregrines II				✔			V	L, M, MC, U													Unix			✔		T	$5,998/12
National Semiconductor Corp. (800) 272-9959	NF3XXX FDDI Adapters				✔			E, I	E, L	128K	✔	✔	✔	✔	✔			✔	✔	✔			A, B		✔		BB, T	$1,195-$1,995/ Lifetime
Network Equipment Technologies, Inc. (415) 780-4249	4615 Sbus ATM Adapter Card (2)			✔				S	U	1M												Solaris, SunOS					BB, T	$1,395/12 (3)
	5215 VME ATM Adapter Card (2)			✔				V	U	1M												Solaris, SunOS					BB, T	$2,395/12 (3)
Network Peripherals, Inc. (800) 674-8855	NP EISA FDDI Adapter				✔	✔		E	E, L	128K				✔	✔	✔		✔	✔		✔		B		✔		BB, T	$1,495-$3,295/12
	NP ISA FDDI Adapter				✔	✔		I	E	128K				✔	✔	✔		✔	✔		✔		B		✔		BB, T	$995-$3,295/12
	NP MCA FDDI Adapter				✔	✔		M	E, L	128K				✔	✔	✔		✔	✔		✔		B		✔		BB, T	$1,495-$3,295/12
	NP Sbus FDDI Adapter				✔	✔		S	L, U	128K										✔			B		✔		BB, T	$995-$2,995/12
	NP ATM Adapter (2)			✔				E, S	L, U	128K								✔	✔			Solaris, SunOS	B				BB, T	$2,000-$2,500/12

100M bit/sec LAN options

Company	Product	Adapter type: 100Base-T	100VG-AnyLAN	ATM	FDDI	TP-PMD	SDDI	Bus type supported (S = Sbus, T = Turbochannel, V = VMEbus, O = Other; E = EISA, I = ISA, M = Microchannel, N = NuBus)	Device board designed for (M = Mainframe, MC = Minicomputer, R = Router, U = Unix-based workstation; B = Bridge, E = End node, H = Hub, L = LAN server)	On-board RAM (bytes)	Drivers supported: VINES	PC/TCP	OS/2 LAN Server	LAN Manager	NDIS	NETBEUI	NETBIOS	NetWare	ODI	PC NFS	Windows	Other	Diagnostic capabilities (A = Network activity LED, B = Link status LED)	Management agents supported: SNMP	SMT	Proprietary	Supports (BB = Bulletin board, T = Toll-free number)	Price/ Warranty (months)
Proteon, Inc. (508) 870-5724	100VG-AnyLAN NIC (1)		✔					E, I, O	E, L, R	64K					✔			✔									BB	(4)/ Lifetime
Sun Microsystems Computer Corp. (415) 960-1300	Sun ATM Adapter (2)			✔				S	U													Solaris						$995-$1,295/ 3-12
	SunFastEthernet Adapter (2)	✔						S	U													Solaris						$795/ 3-12
	SunLink FDDI/S				✔			S	U													Solaris						$3,500/ 3-12
SynOptics Communications, Inc. (415) 988-2400	LattisCell Sbus ATM Host Interface			✔				S	L, U													Solaris					BB, T	$1,795/12
SysKonnect, Inc. (408) 725-4650	SK-Net FDDI EISA Series				✔	✔	✔	E	E, L, U	128K		✔	✔	✔	✔	✔		✔	✔	✔		Interactive Unix, SCO Unix, UnixWare	B				BB	$1,250+/ Lifetime
	SK-Net FDDI ISA Series				✔	✔	✔	I	E, L, U	128K		✔	✔	✔	✔	✔		✔	✔	✔		Interactive Unix, SCO Unix, UnixWare					BB	$995+/ Lifetime
	SK-Net FDDI MCA Series				✔	✔	✔	M	E, L, U	128K		✔	✔	✔	✔	✔		✔	✔	✔			B				BB	$1,250/ Lifetime
	SK-Net FDDI NB Series				✔	✔	✔	N	E, L	1M	✔											Ditto, MacIPX, MacTCP	A, B		✔		BB	$1,950+/ Lifetime
3Com Corp. (800) 638-3266	FDDILink-STP				✔		✔	E	E, L	128K		✔	✔	✔	✔	✔	✔	✔	✔		✔		B		✔		BB, T	$1,295+/ Lifetime
	FDDILink-F				✔			E	E, L	128K		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		B		✔		BB, T	$1,745/ Lifetime
	FDDILink-UTP				✔	✔	✔	E	E, L	128K		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		B		✔		BB, T	$995/ Lifetime

Products highlighted by color were selected for The Short List.

Chart compiled by Chen Paquet

Footnotes:
(1) Shipping in the fourth quarter.
(2) Shipping in the second quarter.
(3) Requires a $595 additional hardware module.
(4) Price not yet set.

ATM = Asynchronous Transfer Mode
CDDI = Copper Distributed Data Interface
EISA = Extended ISA
ISA = Industry Standard Architecture
MCA = Micro Channel Architecture
NA = Not applicable
NDIS = Network Driver Interface Specification
NETBEUI = NETBIOS Extended User Interface
SDDI = Shielded Distributed Data Interface
SMT = Station Management
TP-PMD = Twisted Pair-Physical Media Dependent

Continued from page 44

bumps in the road.

"The ATM standards are evolving so quickly that we are expecting some vendor incompatibilities," Emmett says. "What we experienced so far are physical layer incompatibilities that make it difficult for the server to communicate with the ATM OC-3 interface on the switch. What we are anticipating next are software glitches such as signaling format incompatibilities."

Sticking with one vendor for all ATM switches and adapters will minimize those problems, he says.

FDDI GROWS UP

Incompatibilities occur less often in the mature FDDI environment, where there is proven interoperability among vendor products. There are more products to choose from, as well. FDDI adapters are available for a variety of workstations, as well as internetworking devices such as bridges and routers.

Described by the 1989 ANSI X3T9.5 standard, FDDI is a counterrotating, redundant, dual-ring topology. Access to the network is controlled by a token-passing protocol, similar to the IEEE 802.5 token-ring standard.

Many FDDI implementations are backbone architectures that support host and LAN interconnection. In these environments, the benefits of fiber, such as high bandwidth and protection against electrical interference, are a definite plus.

FDDI devices, such as workstations or bridges, attach to the ring via one of two types of adapters: a Dual Attachment Station (DAS)

Continued on page 48

1994 NETWORK WORLD SHORT LIST

The Short List:

100M bit/sec LAN options

In this Short List, Network World *recommends specific FDDI adapters you should examine more closely in the purchasing process. We also recommend how you should evaluate other 100M bit/sec LAN options when products supporting them become widely available.*

FDDI

■Cisco Systems, Inc.
WorkGroup CDDI/FDDI Adapter family

Products in this family were developed by Crescendo Communications, Inc., which Cisco acquired, and offer strong support for FDDI over twisted-pair wire. In fact, Crescendo technology is the basis for the Twisted Pair-Physical Medium Dependent standard that is awaiting ANSI approval.

The products support Extended Industry Standard Architecture (EISA), Micro Channel Architecture (MCA) and Sbus architectures, as well as a number of software drivers. Cisco's other strong suit is its Simple Network Management Protocol-based WorkGroup Director package for managing the adapters. WorkGroup Director can run on Hewlett-Packard Co.'s OpenView, IBM's NetView and SunConnect's SunNet Manager platforms.

■National Semiconductor Corp.
NF3XXX FDDI Adapters

Products in this family support ISA and EISA buses and have an impressive array of software drivers. National Semiconductor offers free unlimited support seven days a week, 24 hours per day, plus a lifetime warranty, which shows the vendor's confidence that the products will not break down.

■Network Peripherals, Inc.
NP FDDI Adapter family

Products in this family support ISA, EISA, MCA and Sbus architectures and run over fiber or unshielded twisted-pair wire. Included among the many software drivers supported are Microsoft Corp.'s Windows NT and Windows NT Advanced Server. These products have been certified by Novell, Inc. to run in NetWare 3.X and 4.X environments and by Microsoft to run in Windows NT and LAN Manager environments.

■SysKonnect, Inc.
SK-Net FDDI Series

This product family covers all the bases. Each member supports FDDI over multimode fiber, two- and four-wire shielded twisted pair as well as two- and four-wire Category 5 unshielded twisted-pair wire. SysKonnect has boards for the most popular buses and is one of the few vendors to support Apple Computer, Inc.'s NuBus. The vendor also supports a large number of software drivers and offers a lifetime warranty.

■3Com Corp.
FDDILink family

Members of this family are optimized for the EISA bus and support fiber optic, shielded twisted-pair and unshielded twisted-pair wire. 3Com's strong suit is the vast number of software drivers it supports including Windows NT. These products also have a lifetime warranty and unlimited free support.

100Base-T, 100VG-AnyLAN

A key criterion in selecting a 100Base-T or 100VG-AnyLAN board is whether it will need two-pair or four-pair wiring. Also consider internetworking requirements when picking an adapter vendor.

For example, if you have an investment in a particular hub, verify that the adapter vendor you select has a product that interoperates with that hub.

ATM

When selecting an Asynchronous Transfer Mode (ATM) adapter, a key consideration is making sure it will work with various vendors' ATM switches. One of the first areas likely to cause interoperability concerns is the signaling, or call setup software, that the adapter uses. Adapter and switch vendors may use variations of the same signaling software, which can cause interoperability woes.

Continued from page 47

or a Single Attachment Station (SAS) adapter. DAS adapters physically connect devices to both the primary and secondary rings and, as a result, offer greater fault tolerance. SAS adapters connect workstations to an FDDI concentrator via a single fiber cable in a star topology.

FDDI's reach is extending, thanks to advancements in FDDI-over-copper technology. Enhancements to support twisted-pair media were finalized last December and are now pending final ANSI approval.

The new FDDI-over-copper standard is called Twisted Pair-Physical Medium Dependent (TP-PMD) Version 2.0, which enables FDDI to run over Category 5 unshielded twisted pair or IBM Type 1 or 2 shielded twisted pair for a distance of up to 100 meters.

TP-PMD is based on the Copper Data Distributed Interface (CDDI) specification developed by Crescendo Communications, Inc., which was acquired by Cisco Systems, Inc. Crescendo developed the multilevel data encoding scheme, known as MLT-3, that was to form the basis of the TP-PMD specification. MLT-3 keeps the electrical signal generated by 100M bit/sec transmissions within acceptable radiation limits.

Prior to the completion of TP-PMD, several vendors had competing FDDI-over-twisted pair options. One solution for FDDI over shielded twisted pair was called Twisted Pair-FDDI (TP-FDDI). Favored by 11 chip and hardware vendors, TP-FDDI was also known as the green book standard. Vendors that supported TP-FDDI have or are moving into the TP-PMD camp. Another shielded twisted-pair solution, known as Shielded Distributed Data Interface (SDDI), is still around and count IBM and 3Com Corp. as major supporters.

One of FDDI's advantages is the Station Management (SMT) protocol that enables FDDI adapters to basically manage themselves. Unlike managemet facilities for other fast LAN options, SMT is built into the FDDI specification.

Adapters supporting SMT ensure proper operation of the ring by swapping information about the three FDDI layers — Media Access Control (MAC), Physical and Physical Medium Dependent — running on each one.

Three areas of FDDI management have been defined in SMT. Frame-based Management gathers information about current FDDI network operation. Connection Management handles the physical connections and network topology. Ring Management deals with factors that concern the logical ring operation, such as the proper circulation of the token.

SMT lets adapters initialize themselves, isolate and recover from faults, and collect performance statistics without the involvement of a net management console. In other environments, net managers have to enter commands from a management console or protocol analyzer to perform these functions.

Eric Nystrom, chief network architect for Norwest Mortgage, Inc. in Minneapolis, turned to FDDI when his 16M bit/sec token-ring backbone ran out of horsepower. Norwest's network consists of a collapsed FDDI backbone with routers that connect to the department token rings and, via frame relay, other offices.

"When we looked at backbone technologies over a year ago, ATM was not ready for prime time, and fast Ethernet was not yet available," Nystrom says. "We selected FDDI for its proven technology that provided reliability and redundancy. If we had to revisit our decision today, we would still go with FDDI, although we might opt for the TP-PMD cabling option to replace some of our current fiber connections."

Buyers shopping for FDDI adapters should pay attention to the bus structure and software drivers supported. Notable among the products listed in the chart are the ones made by Cabletron Systems, Inc. and SysKonnect. Both vendors have FDDI adapters available for Apple Computer, Inc.'s NuBus, which benefits users in the publishing industry that are using FDDI bandwidth to support high-end graphics at the desktop.

While ATM and FDDI utilize advanced networking concepts, there are a few options for net managers who are looking to preserve their existing Ethernet or token-ring environments.

Chief among these new technologies is 100Base-T, which preserves the well-proven and understood concepts of Ethernet while developing new transmission technology that makes the network run 10 times as fast. The 100Base-T plan is being pushed by the Fast Ethernet Alliance. The plan assures no change in the upper layer protocols and software that run on the workstation's Ethernet adapter, and a straightforward scaling of the carrier-sense multiple access with collison detection technique found in Ethernet's MAC layer to oper-

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ate at 100M bit/sec.

The physical layer does require modification to support 100M bit/sec transmission, however. Designing that new physical layer has become controversial. Two competing – and incompatible – proposals have been offered. The 100Base-X proposal is based on FDDI signaling technology and operates over two pairs of Category 5 unshielded twisted pair. The 4T+ proposal is a new and different technique that requires four pairs of the lower cost Category 3 unshielded twisted pair. Vendors in the Fast Ethernet Alliance are developing products that support both the 100Base-X and 4T+ options.

Understanding UTP cable categories

Categories 1 and 2
Used for voice and low-speed data transmission.*

Category 3
Used for voice and data transmission at 16 MHz. Typically used in 4M bit/sec token-ring and 10M bit/sec IEEE 802.3 10Base-T LANs.

Category 4
Used for voice and data transmission at 20 MHz. Typically used in 16M bit/sec token-ring LANs.

Category 5
Used for voice and data transmission at 100 MHz. Typically used in 16M bit/sec token-ring and 100M bit/sec LANs, such as the TP-PMD version of FDDI.

* Not part of ANSI/EIA 568.

Information was drawn from ANSI/EIA 568 document titled "Commercial Building Telecommunications Wiring Standard." The standard applies to 4 pairs of 22- or 24-gage unshielded twisted-pair wire that are bundled together in a plastic jacket.

In modifying the physical layer to operate 10 times faster, the network span is reduced by the same factor – roughly 250 meters from the previous 2,500 meters.

The 100Base-X proposal includes several alternative cabling options to the required two pairs of Category 5 unshielded twisted pair. These options include two pairs of shielded twisted pair or 62.5/125 micron multimode fiber-optic cable.

100Base-X uses the CSMA/CD MAC layer and a frame format that is identical to conventional 10M bit/sec Ethernet. Timing parameters are scaled to account for the tenfold increase in the transmission rate. Advantages of the unchanged MAC layer include the industry's technical familiarity with the CSMA/CD algorithm, known performance dynamics and interoperability, says Larry Birenbaum, vice president of engineering at Grand Junction Networks.

The Physical Data Link functions of 100Base-X are implemented across three functional layers. The lowest layer is derived from TP-PMD. Next is a Convergence Sublayer that converts TP-PMD's continuous 125M bit/sec full-duplex data stream to the 100M bit/sec half-duplex data stream used by the upper layer, derived from the IEEE 802.3 MAC standard.

Maintaining the technical continuity of conventional Ethernet allows vendors to build products that can switch between 10M and 100M bit/sec operation.

Scott Armstrong, director of technical services at Data Recognition Corp. in Minneapolis, needed extra horsepower for his data-intensive 10Base-T network with databases of up to 500M bytes. Armstrong's first attempt to balance the server load – and optimize precious bandwidth – was to divide the network into five segments, each addressing a separate interface card on a Novell, Inc. NetWare 3.11 server.

That approach brought some relief, but not a long-term solution. Armstrong then turned to Grand Junction Networks for the extra horsepower. He added a separate 100M bit/sec interface to the server, which connected to a separate 100M bit/sec port on a Grand Junction Networks switching hub.

"This solution was less expensive than FDDI or ATM, and it allowed us to maintain our investment in 10Base-T," Armstrong says. The server-to-hub cabling, which required shielded twisted pair, was not a major issue since both devices were located in the same equipment room, and no extensive rewiring was required.

Armstrong cautions network managers with similar challenges to purchase all fast Ethernet components from one manufacturer to assure interoperability. "With the standards still under development, we concluded that the only safe solution is a single-vendor solution," he says.

The alternative 100Base-T physical layer is called 4T+ – named for the four pairs of Category 3, Category 4 or Category 5 unshielded twisted-pair wire it requires.

Of the four pairs required for 4T+, three are used for data transmission. The fourth is used for collision detection. A different data encoding scheme, 8B6T, replaces the Manchester encoding used with conventional Ethernet schemes.

The 4T+ proposal maintains compatibility at the Logical Link Control and MAC layers of Ethernet. The Physical Signaling Sublayer (PLS), which includes medium- dependent functions, is relocated into the Medium Attachment Unit, or transceiver. The resulting 4T+ physical layer is then partitioned into four layers: the Medium Dependent Interface (MDI), Physical Medium Attachment (PMA), PLS and Medium Independent Interface.

The MDI provides attachment to the four pairs of cable. The PMA handles transmit and receive functions, plus collision detection, while the PLS handles data encoding. The 8B6T converts groups of 8 bits into one of six ternary signals that are then distributed to the four pairs of wires.

100VG-ANYLAN

A third new technology, designated 100VG-AnyLAN, permits both token ring and Ethernet to operate at 100M bit/sec. 100VG-AnyLAN defines a new access method, known as Demand Priority.

The key to Demand Priority is that it preserves Ethernet or token-ring data frame formats. Proponents claim that this decision will make internetworking via bridges and routers, plus compatibility with existing network management tools such as protocol analyzers, more likely. Due to the new technology, 100VG-AnyLAN development is assigned to a different IEEE working group – 802.12 instead of 802.3.

The 100VG-AnyLAN plan calls for transmission over four pairs of Category 3, Category 4 or Category 5 unshielded twisted-pair, with future support for two-pair unshielded twisted pair, two-pair shielded twisted pair and fiber-optic cables. The cabling lengths are 100 meters for Category 3 unshielded twisted pair and 150 meters for Category 5 unshielded twisted pair or shielded twisted pair.

The four pairs used in 100VG-AnyLAN comprise four separate transmission channels, with a data rate of 25M bit/sec each, yielding an aggregate rate of 100M bit/sec.

The 100VG-AnyLAN network consists of a central hub that is also called a root hub, which connects via links to nodes or other hubs. As many as three levels of cascading is permitted. Each 100VG-AnyLAN hub may be configured to support Ethernet or token-ring frames. However, all hubs in a network must be configured for the same frame type, meaning Ethernet and token-ring frames cannot be mixed in the same net.

When a 100VG-AnyLAN node wishes to transmit, it sends a low-frequency tone to the hub requesting normal priority for routine data and high priority for time-sensitive data such as multimedia.

The hub internally polls its ports, identifying the ones that have requested net access. High-priority requests are serviced first, followed by priority requests.

Managers with token-ring nets should consider the 100VG-AnyLAN. "The critical difference between 100VG-AnyLAN and other proposals is its potential to support additional frame structures, including IEEE 802.5 token ring, plus other cable types," says Thomas Racca, Proteon's director of product development and business planning. "Token-ring users implementing high-speed applications, such as CAD/CAM, desktop publishing and multimedia, now have optimal migration flexibility with 100VG-AnyLAN."

WHAT'S THE RUSH?

With so many technologies fighting it out to become the roadbed upon which fast LAN highways are built, some net managers are intent to sit back and wait for the dust to clear. Taking this tact is even more warranted when budget constraints force net managers to tweak existing LAN environments to increase performance while they wait for the price of new alternatives to drop.

Pat Clifford, staff specialist at United Air Lines, Inc. in Denver, says his group will consider fast LAN upgrades more seriously when the price becomes less than double the current workstation attachment cost – for example, they hit the $400 to $500 level that fast LAN vendors have promised.

"We have a definite requirement for more bandwidth," Clifford says. "We have a proprietary graphics application used at pilot training workstations that simulates flight deck instrumentation. But with the economy of the airlines such as it is, we cannot justify the additional expense as long as our current Ethernets can be adapted to meet the need."

What Clifford and other users have to look forward to is the rollout of the 1995 100M bit/sec LANs. The question is which will get the greatest long-term performance?

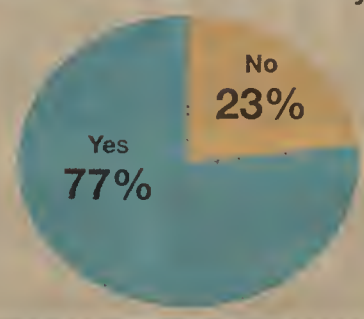
LBL's Fink echoes the uncertainty of many network managers. "Product trends in the fast LAN market are too early to predict," he says. "Two uncertainties exist: Will fast Ethernet products knock off FDDI, and will ATM eclipse all packet LANs as we know them today? Of course, if network managers knew the answers to these questions, we would be selling products, not using them."

Miller is a contributing editor, president of DigiNet Corp., a Denver-based data communications engineering firm, and author of many networking books. He can be reached via the Internet at mark@diginet.com.

Reader views on 100M bit/sec options

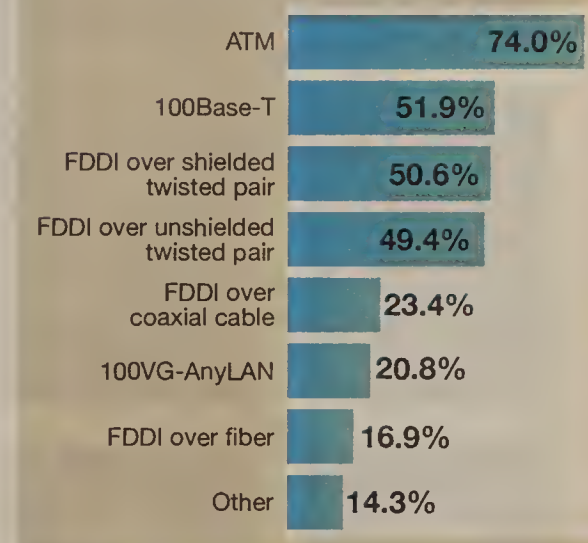
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Will you be evaluating the need to install a 100M bit/sec LAN in the next 2 years?



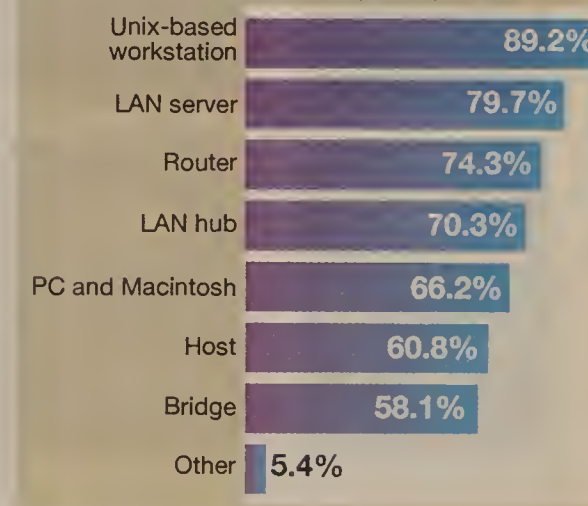
Which 100M bit/sec LAN options will you evaluate?

Based on 77 responses; multiple responses were allowed.



On which platforms will you consider installing a 100M bit/sec LAN adapter?

Based on 74 responses; multiple responses allowed.



Which is the most important feature in your evaluation of 100M bit/sec LAN adapters?

Based on a highest possible score of 5.

Support for common network management protocol	4.52
Support for existing physical- and data-link layer protocols	4.33
Autosensing for switching between 100M bit/sec and lower speed operation	3.49

Readers cite reasons for evaluating an increase in LAN speed.

"Our network is totally saturated. If the price were cheaper, we would have done it by now."

"The speed of our LAN must be increased to handle large graphics, scanned optical images and multimedia files as well as live-action video."

"[We need higher speed to support] multimedia applications, to account for more users and to attain better performance."

The information in this graphic illustrates key findings of a recent *Network World*/Focus Data, Inc. reader survey on 100M bit/sec LAN options. Focus Data, an independent market research firm in Framingham, Mass., conducted the survey and tabulated the results. For more information on Focus Data services, call (508) 626-2556.

GRAPHIC BY SUSAN SLATER

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Van Jacobson *keeps communications channels open*

Profile



BY PAULINA BORSOOK

While he is devoted to opening clogged network channels so people can communicate more freely, Van Jacobson is the modern model of a shy, eccentric genius. His closest colleagues find it difficult to get him to respond quickly to electronic mail and nearly impossible to get him on the phone.

There is a simple reason for why he's so hard to reach; he's passionate about his work and often doesn't find time for idle chatter. Instead, the caffe latte addict keeps vampire hours fixing the technical kinks in the Internet's communications infrastructure.

A consummate Internet insider, Jacobson is the major force behind many improvements to the Internet. Two of the most important engineering achievements came when he found a way to break through bottlenecks that threatened to choke the Internet in 1987 and codeveloped the Internet's Video Audio Teleconference (VAT) multicast capability that supports video-, audio- and data-conferencing in a simple and straightforward way.

"Either his work on congestion control or on the Video Audio Teleconference multicast would be considered a major accomplishment," says Noel Chiappa, member of the Internet Engineering Task Force (IETF). "But the two together . . . ."

Chiappa says Jacobson exemplifies the difference between the type of people consultant Marshall Rose calls goers and doers.

"Goers are content to go to meetings and write specs," Chiappa says. "Doers are content to stay off in a corner and really do something. Van is the ultimate doer."

Jacobson could become famous if he wanted to, says Dan Lynch, founder of the INTEROP trade show. But it's Jacobson's choice to stay away from the limelight and concentrate instead on fostering the growth of the Internet.

Jacobson's network philosophy is straightforward, Lynch says. "[Van feels] there has to be a simple way to do something, or we'll never be able to understand how to control it," Lynch says.

While Jacobson looks for simple solutions, he also draws on experimental scientist instincts developed when he looked for ways to predict and channel the behavior of real-world phenomena. Lynch says part of Jacobson's networking genius lies in using those instincts when "staring at the flow of network traffic, looking at a printout of tests and watching the behavior of active systems."

Perhaps unconsciously adopting the attention to detail habits of a 19th-century naturalist, Jacobson says in a rare interview that he shapes his thinking about networking by borrowing from complexity theory, which examines the self-organizing tendencies of the natural world.

Jacobson also thinks the exponential growth of the Internet can be an antidote to the passivity Nintendo-playing may be breeding in the current generation.

"Communications is inherently interactive, not passive," Jacobson says. "And you can only communicate if you have something to say, which means having a full life outside of [computer] networking."

Title:
Researcher at LBL

Chief innovations:

- **Developed several ways to improve TCP/IP performance.**
- **Worked on congestion control mechanism for the Internet.**
- **Invented compressed Serial Line Internet Protocol.**
- **Codeveloped VAT, a multicast capability that enables users to conduct video, audio and data conferences across the Internet.**

Education:
B.S. degree and a doctorate in physics from the University of Arizona.

INNOVATIVE START

Inside the world of networking, Jacobson has done much to boost Transmission Control Protocol/Internet Protocol performance. One of his early notable contributions came when Jacobson invented a way to double the performance of the Transmission Control Protocol, says Craig Partridge, director of Bolt Beranek and Newman, Inc.'s gigabit project.

"[Van] does a really nice job of making other people's ideas work fiendishly faster," Partridge says. He cites an incident that took place at the 1987 Usenix Unix users group conference in Phoenix as an example.

Partridge was sitting next to Jacobson while a famous network scientist delivered a paper asserting that TCP/IP had reached its theoretical limits at 5M bit/sec.

"Van's mouth was getting straighter and straighter, his eyes were flashing, and he shook his head a bit," Partridge recalls. "[Van] kept saying, 'That's not right.' "

A year later, Jacobson was speaking on TCP round-trips at an Association for Computing Machinery Special Interest Group on Communications meeting at Stanford University. He was 20 minutes into a 30-minute talk when he started in on what eventually became an additional 25-minute talk describing an algorithm capable of pushing TCP/IP to 10M bit/sec, Partridge says.

"The entire room was engrossed," Partridge says. "No one cared that Van had gone way over his allotted time."

Jacobson credits something he learned while studying physics in high school for helping him become innovative. "In physics, unlike other subjects, the most important thing is learning to ask the right questions."

While earning his doctorate, Jacobson did some graduate student work at Lawrence Berkeley Laboratory (LBL), where he gained expertise in data-acquisition and control software for linear accelerators, which are atom smashing devices. Working with the accelerators, Jacobson learned how to ask the right questions.

In 1978, the man INTEROP's Lynch calls a "defrocked physicist" took a break from physics and computers to be a ski bum at the Alta ski resort in Utah, taking with him his collected works of Shakespeare and books of poetry by Ted Hughes and W.S. Merwin.

Jacobson says he was the "laundry lady" at the lodge, a job that allowed him to ski all day and do laundry by night. Toward the end of this two-year stay, he reread Stanford Professor Don Knuth's book *The Art of Computer Programming* and realized it was time to return to being a working scientist.

Once back in LBL, he worked extensively with Berkeley Unix developer Mike Karels and came up with Slow-Start, a means to solve the congestion gridlock that by October 1986 had slowed Internet performance down from 56K bit/sec to 320 bit/sec.

After struggling with the problem for six months, Jacobson had a late-night Berkeley cafe insight. Falling back on his training as a physicist, Jacobson figured out that the solution would come if he asked the right question: "How was the Internet ever able to work in the first place?"

Jacobson found his answer when he realized the Internet's basic mechanism of computers constantly retransmitting messages until they got through was the cause of networkwide traffic jams. Then it hit him. Overcoming this problem was a matter of building mechanisms that were able to engineer some "politeness" into the setup, which is what Slow-Start does.

Also known as the Van Jacobson technique, Slow-Start delays packet-transmission rates by milliseconds to seconds. The technique is "polite" because it requires packets about to transmitted to wait for others that may already be on the network to be delivered before jumping into the traffic flow.

Slow-Start was built into Berkeley Unix in 1987 and subsequently shipped all over the world. And largely because of Slow-Start, the Internet continues to function relatively congestion-free, although it has grown from 10,000 users then to 10 million now.

Jacobson's other well-known feat is the work he did to advance the multicast conferencing capacity of the Internet. While Jacobson has done much work in this area, the most notable effort came when he teamed with Steve Deering, a researcher at Xerox Corp.'s Palo Alto Research Center to coinvent VAT, a mechanism that allow for smooth delivery of audio data over the bursty TCP/IP-based Internet.

People can generally tolerate jerkiness in video transmission and can wait for a screen to fill in with data, but they cannot tolerate speech that is erratic and herky-jerky. VAT helps keep audio in sync with video and other data in a conference by computing how long packets take to arrive and then slowing down voice replay accordingly.

The IETF's Chiappa remembers the first E-mail message he received from Jacobson, as do others.

"People save Van's rare messages," BBN's Partridge says.

But in his first message to Chiappa, Jacobson prefaced a discussion of controlling computer networks by mentioning that he was sipping from a snifter full of brandy, around midnight. This seemed "so like Jacobson, so civilized, so old-fashioned and so gentlemanly," Chiappa says.

Borsook is a free-lancer in San Francisco and can be reached via the Internet at loris@well.sf.ca.us.

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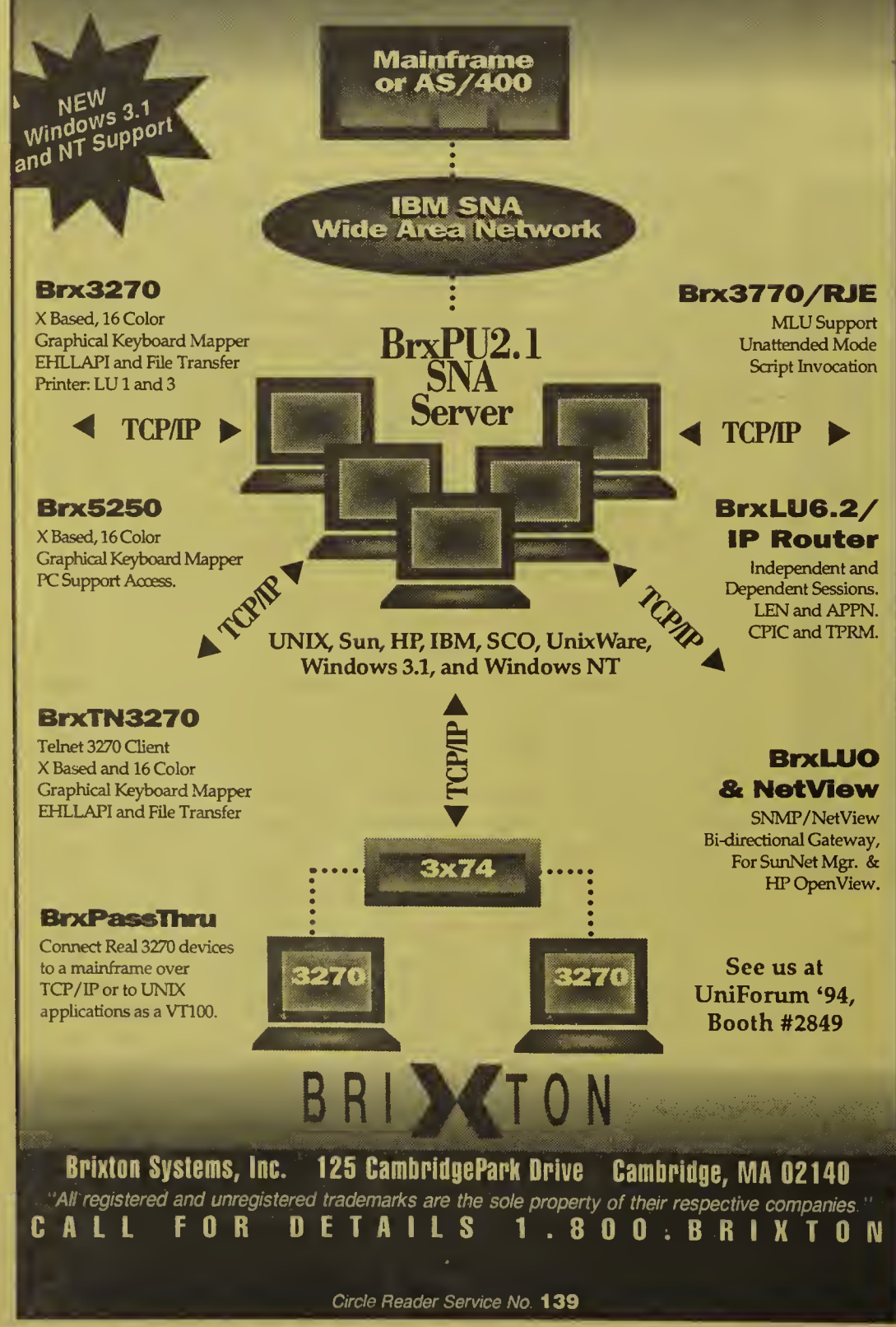
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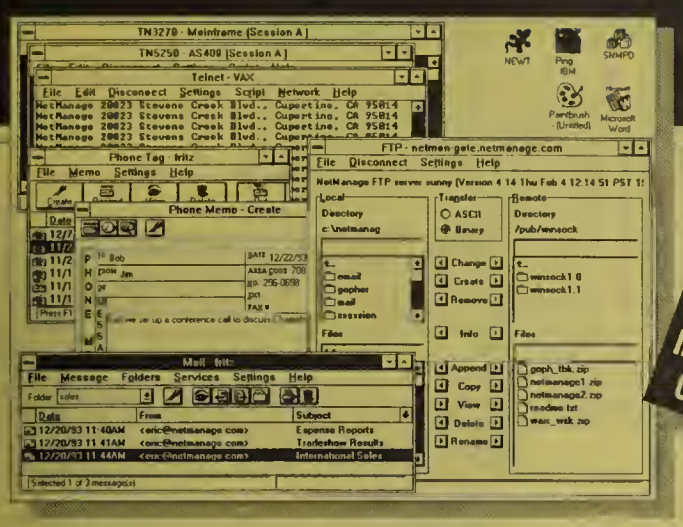
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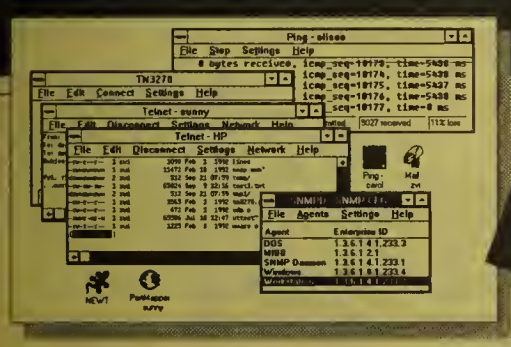
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SNMP for Windows



CHAMELEON™ 100% DLL NFS ■ RPC SNMP

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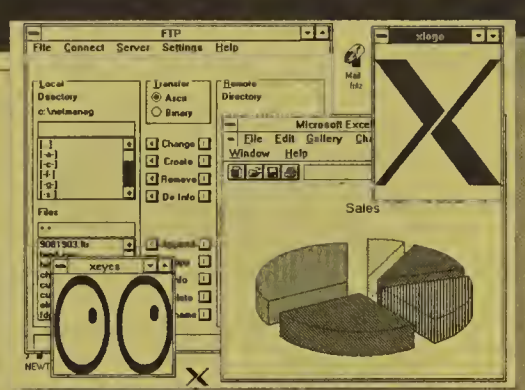
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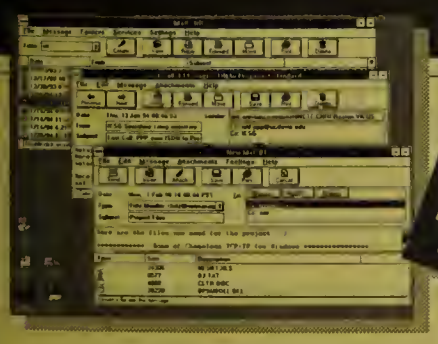
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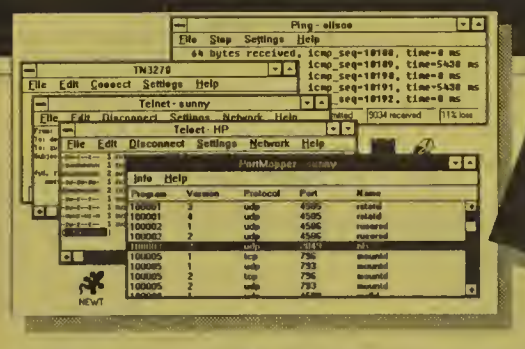
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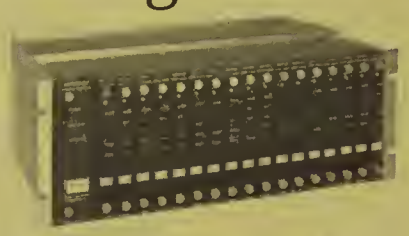
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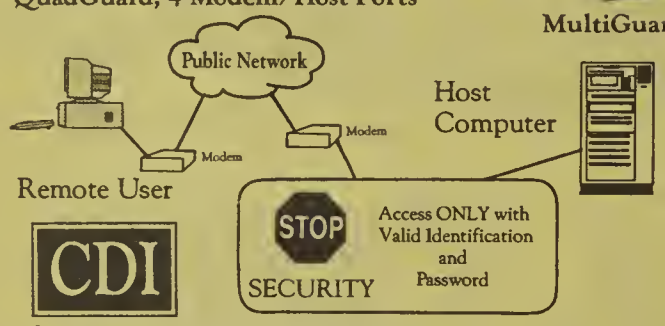
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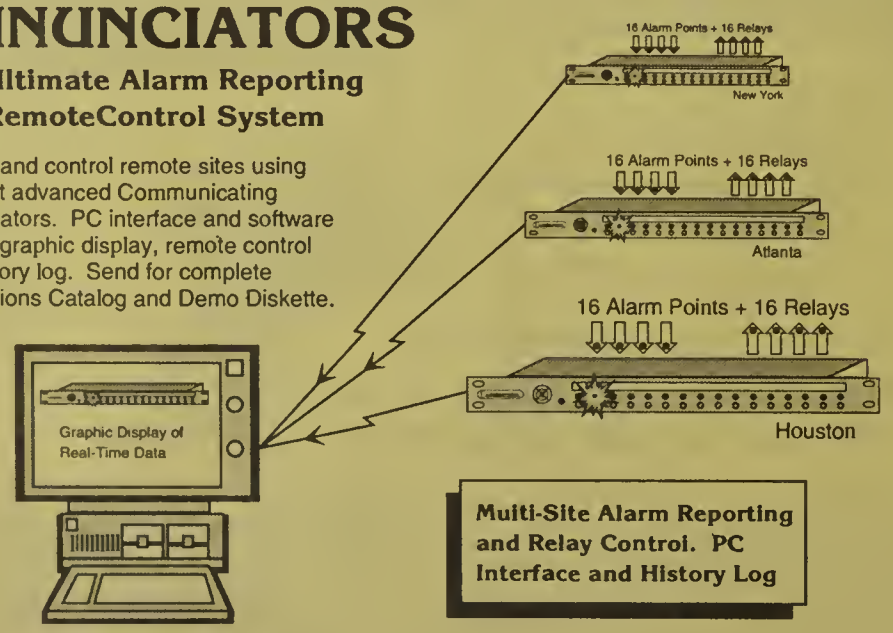
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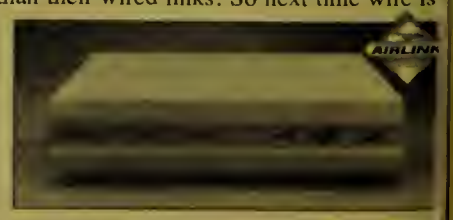
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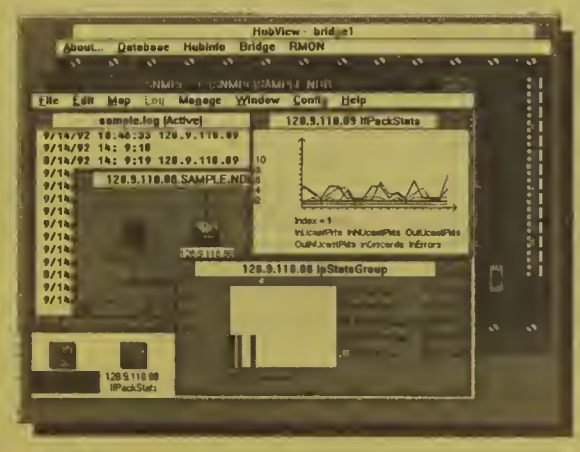
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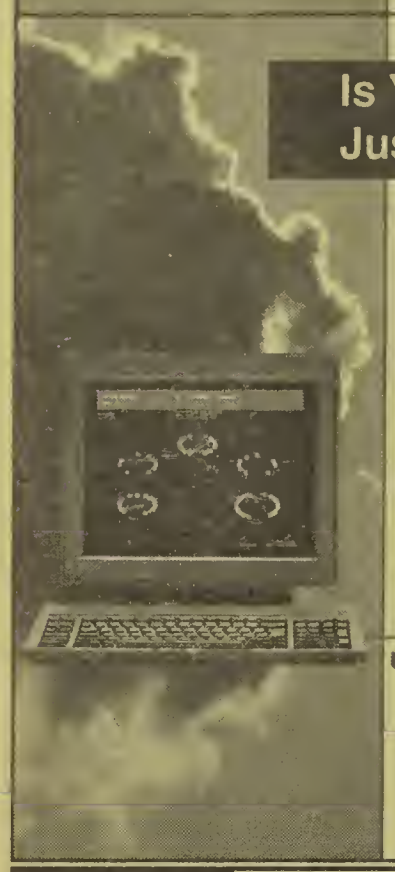
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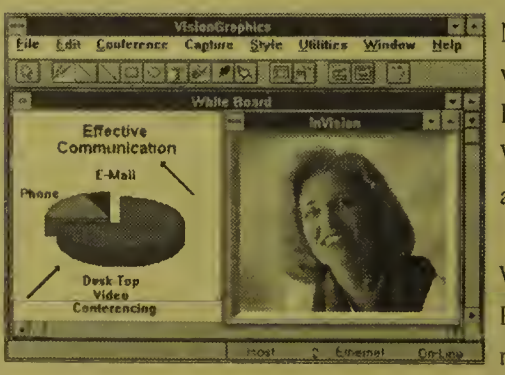
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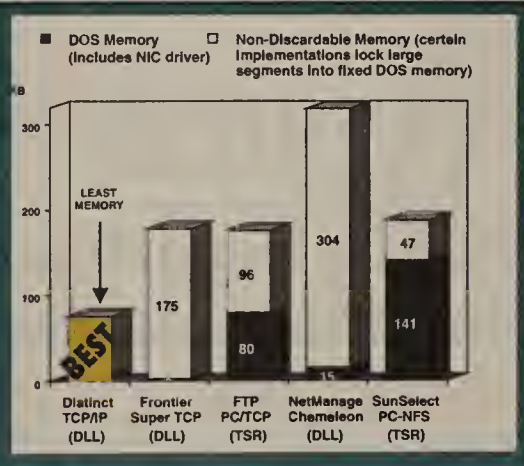
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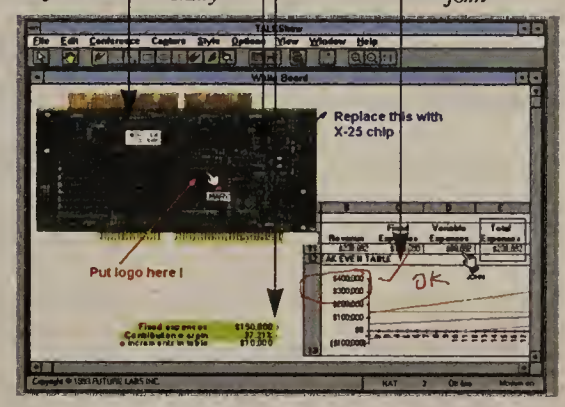
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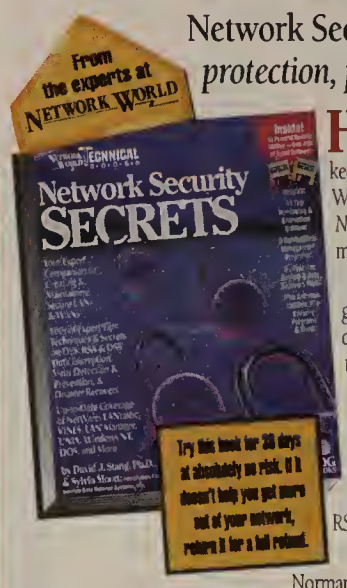
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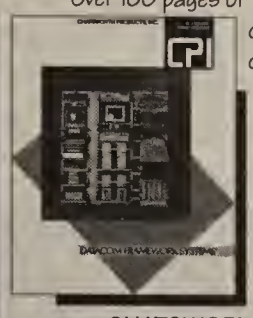
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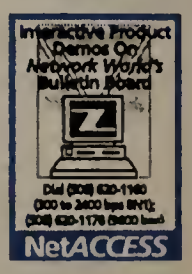
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Internet culture

Continued from page 1

"The Internet isn't just another tool," said Joel Maloff, former vice president of Advanced Networks & Services, Inc. who now advises firms on Internet issues. "It's a community you're entering, and you need to understand the rules of that community."

It's an especially important lesson because Internet users fight back against perceived wrongs: The ease with which a company can flood conferences or electronic mail with advertisements is matched by the ease with which recipients can mail thousands of angry replies.

Daniel Dern, author of *The Internet Guide for New Users* (McGraw-Hill), said that while sending out mass mailings may seem a low-cost way to reach thousands of people, they actually entail significant costs. Recipients waste time, and in some cases, money, reading them. And senders will soon find themselves spending large amounts of time answering or deleting replies from upset Internet users.

NEIGHBORHOODS OF EQUAL

If the Internet is a community, mailing lists and Usenet conferences are its neighborhoods. There are conferences to discuss the politics and culture of countries and cities, places to ask questions about home repair or talk about fruit-fly genetics, hundreds of areas in which to chat about every conceivable facet of computers.

Each of these — there are more than 5,000 Usenet conferences, or "newgroups," alone, in several different languages — have their own unique feel and way of doing things. Discussions in the Usenet conference rec.crafts.textiles have a completely different feel from those in, say, sci.physics or alt.fan.tonya-harding.whack.whack.whack.

"It's the most egalitarian community I've ever seen," because people are judged on what they say, not their age, race or appearance, Maloff said.

So far, Grant, whose farm stand business really is called Farmer Grant's, has been judged a model Internet citizen. He does not bombard conferences or individual E-mail boxes with obnoxious, high-powered advertisements. He does provide a catalog that lets users decide how much they want to see. And the catalog is sort of cool, a widely admired attribute.

Brad Templeton, president of Clarinet Communications Corp., which distributes wire-service news and syndicated columns — as well as the "Dilbert" comic strip — to subscribers over the Internet, said Internet denizens like companies that give something back to the community, rather than just exploit it.

Grant's link to the Internet is Branch Information Services, a start-up company in Ann Arbor whose Internet server also offers a way to order magazines and various novelty and promotional items.

Company President Jon Zeef has been an Internet user for several years and has seen the reaction to companies that repeatedly post the same sales pitches over and over again. These companies acquire a bad rep in the 'Net's institutional memory.

Dern said some companies deal with the cultural issue by setting up their own newsgroups for posting press releases and product information, as well as for providing customer support. The firms include Digital Equipment Corp. and The Santa Cruz Operation, Inc. These conferences are in what is known as the "biz. hierarchy," set aside for commercial purposes.

Peter Farley, psychology editor at Sinauer Associates, Inc., a textbook publisher in Sunderland, Mass., learned the value of the network when one of its authors mentioned his book in a relatively obscure scientific newsgroup. The company soon received inquiries from around the world about the book.

Farley said he would love to see somebody create conferences where companies could advertise textbooks in specific fields. Even then, companies have to be careful. "It's a very connected world," and somebody who is dissatisifed will likely make that known quickly and loudly around the world, Templeton said.

So how do companies let Internet users know they are on the Internet?

Occasional, short blurbs advertising new Internet services are considered acceptable in the alt.internet.services newsgroup on Usenet. Several people maintain lists of interesting services on the Internet, and companies can seek to get on those.

Zeef said he got into the Internet business last year when he saw Mosaic, a graphical user interface to the World-Wide Web, a distributed-information system on the network. "Mosaic was the first application I saw where I went 'Wow! Great!'" he said.

Many commercial services on the Internet — such as the Global Network Navigator on-line magazine by O'Reilly and Associates, Inc. of Cambridge, Mass. — are available through the World-Wide Web.

Getting down to business

Economic and Business resources. Use Gopher to connect to riceinfo.rice.edu. Select "Information by subject area," then "Economics and Business" to access dozens of business-related databases and document collections.

Securities and Exchange Commission filings. Use File Transfer Protocol (FTP) to connect to ftp.town.hall.org. Switch to the pub/edgar directory and get the general.txt file. Or send E-mail to mail@town.hall.org with a message of "help."

Fedworld. Use Telnet to connect to fedworld.gov to access dozens of federal databases and a sales center for federal documents.

The Internet Mall. Use FTP to connect to ftp.netcom.com to retrieve this list of companies that sell products over the Internet. Look in the pub/guides directory.

Com-priv. Send an E-mail request to com-priv-request@psi.com to get on this mailing list for discussing the commercialization and privatization of the Internet.

Auto group ponders Internet for E-mail

An automative industry group is considering the Internet as a means of sharing electronic mail with business partners.

The Automotive Industry Action Group, a trade group through which auto manufacturers tackle issues of common concern, is readying a document that will describe how the industry should exchange electronic mail with suppliers and dealers.

Although the Internet is one consideration as a transport mechanism due to its low cost and ubiquity, security issues and the lack of guaranteed message delivery leave users wary.

"We're considering it for business," said Joe Phelan, manager of supplier communications at Ford Motor Co. "But our attitude is one of caution."

The Automotive Industry Action Group has just finished its first draft of the "E-Mail Business Practices" document. The final version will include E-mail auditing requirements, required security features and guaranteed delivery mechanisms, which may be too much to ask of the Internet.

BY ELLEN MESSMER

Ameritech to launch IP services in 5-state region

BY ELLEN MESSMER

Chicago

Ameritech will make its debut as an Internet connectivity provider in the second half of the year, offering users yet another choice in the growing Internet access marketplace.

Ameritech will be the first of the regional Bell holding companies to jump into the fast-growing Internet business. While Ameritech's strong presence in the Midwest could make it a leading contender in the Internet Protocol services market there, regulatory restrictions will require Ameritech to build alliances with long-haul IP providers in order to be a success.

Mark Knopper, director of network information infrastructure at Ameritech's advanced data services division, said the company is deploying Transmission Control Protocol/IP routers widely in its network. Proximity to the user will hold down costs, particularly for universities or businesses that have had to order T-1 lines to get to their IP providers' nearest point of presence.

But under the Modified Final Judgment restrictions governing the Bell companies, Ameritech is not permitted to transport IP data traffic across local access and transport areas. Ameritech is seeking long-haul IP partners that it can hand off traffic to under a nondiscriminatory access policy, he said.

Ameritech plans three basic types of IP service. The first would involve offering dedicated access to the IP net over frame relay and private lines ranging from 56K bit/sec to T-3. The second would be dial-up Integrated Services Digital Network access. Later this year, Ameritech will offer IP access to information services, as well.

Ameritech plans flat-rate access pricing, rather than usage-based pricing, although it is not revealing prices just yet. Security services will be a big part of the company's effort to woo business, but the RBHC declined to offer details.

Lawrence Technological University in Southfield, Mich., has already had Ameritech knocking on its door for business.

Rory Savageau, computer specialist there, said the university is looking to purchase T-1 access to the Internet, and the university is now reviewing competing service proposals from Ameritech, Msen, Inc., CICNet, Merit, Inc., Performance Systems International, Inc. (PSI) and Advanced Network & Services, Inc.

"Ameritech is definitely competitive and definitely the most negotiable [in terms of price]," Savageau said.

Ameritech's pricing flexibility stems from the Bell company's certainty that it won't have to file tariffs for IP service. According to a spokeswoman for the RBHC, IP service is regarded as an enhanced service, such as frame relay or Switched Multimegabit Data Service, that does not have to be tariffed.

Ameritech will be more facilities-based — owning, rather than leasing, its lines — than anyone else in the region, said Joel Maloff, consultant at Ann Arbor, Mich.-based The Maloff Co. That should help the carrier hold down costs.

"They have the ability to price down to a point where a PSI or anyone else has no incentive to build," he said.

Use caution when 'Finger' does the walking

Call it Internet marketing run amok.

Over a two-week period in January, Software Tool & Die, an Internet provider in Brookline, Mass., received hundreds of copies of a printed computer parts catalog — all addressed to users of the company's The World Internet service.

The company eventually found out it was victim of a contractor for a mailing list firm that knew only enough about an Internet tool called Finger to be really dangerous.

The command lets an Internet user see who is logged on to an Internet host at a given time. Over a period of several days, somebody working for the mailing list vendor repeatedly used the Finger tool on The World and compiled a list of everybody who was using the system at that time.

The contractor's mistake was in assuming these people were all employees, rather than subscribers to a service. The person combined these names with Software Tool & Die's address into a list of potential prospects that was then sold to the computer parts company.

The result: a waste of money for the parts firm and a serious inconvenience for Software Tool & Die, whose em- ployees were kept busy throwing the catalogs out as soon as the mailman delivered them — some 300 arrived on one day alone.

BY ADAM GAFFIN

Wells Fargo

Continued from page 1

For example, the bank decided that the branch office automation project would involve LANs running only the Internet Protocol, which the company considers the most stable. 3Com had the most robust IP routing implementation, Russo said.

Another criterion was hot-swappability — the ability to replace a card while the router keeps running. "3Com's was the only top-quality router that was hot-swappable and reasonably priced" when the purchase decision was made last summer, said Eric Hughes, network engineering architect and manager of network management development and testing.

The bank is about 100 routers into the branch office project. "It is working," Russo said.

The Wells Fargo move bucks a trend that has users hesitant to pursue multiple router vendors for key segments of their networks. The reasons have included having to settle for the lowest common denominator of functionality across different suppliers' products, added management complexity and skill requirements, and a lack of confidence in relatively new open routing protocols, such as Open Shortest Path First (OSPF).

In the Wells Fargo project, the 3Com, Digital and Wellfleet routers communicate via OSPF, which Hughes said has presented no problems as yet.

But "the biggest reason I don't see people mixing and matching is because companies want to manage the network so they can deliver the service level users have come to expect," said Andrew Roehr, senior technical manager at BSG Consulting, Inc., a systems integrator in New York. "Using different vendors' routers, this might be a very big bullet to bite."

Hughes anticipated the management issue required all vendors play in a Hewlett-Packard OpenView environment and said the bank intends to continue developing an OpenView environment that integrates the management of all the devices. Still, Hughes acknowledged, while the Simple Network Management Protocol is the common management denominator, "as we add routers, we add layers of complexity."

The risk is worth it, he said, because he has fueled competition among vendors. "But to make it work, you better get someone as interested in forming business relationships as they are in technical solutions. You have to make sure your vendors get along."

A word to the wise

Eric Hughes, network engineering architect for Wells Fargo, offers the following advice for companies considering mixing router vendors:

1. **Appoint an end-user champion who is savvy about both vendor relationships and technology.**
2. **Expect an added layer of management complexity with each disparate router.**
3. **Weigh giving up a single vendor's unique features in some parts of the network against not being restricted to one supplier.**

Wells Fargo has also minimized the degree of disparate router communications by using the DECNIS devices for just one function and linking the 3Com and Wellfleet gear only in the company's data centers.

The Digital layer is included for its ability to blend 56K bit/sec lines onto a T-1 for more efficient bandwidth utilization, as well as split a T-1 apart so channels can be routed to different branches, said Val Sribar, program director at Meta Group, Inc. in Reston, Va., who helped the bank plan the project.

If 3Com routers were to gain this function, the Digital layer could be removed, Hughes said.

The anticipated need to route among branches is why the bank is not considering 3Com's Boundary Routing devices, which offload router complexity and configuration management to a more sophisticated, centralized 3com router.

Eventually, Hughes expects the bank will migrate from the 10Base-T LANs to a switched environment, such as a public Switched Multimegabit Data Service, or to public frame relay or Asynchronous Transfer Mode switched virtual circuits.

OSI

Continued from page 1

future of standards setting in the U.S. government.

Agencies such as the National Library of Medicine and vendors like SunSoft, Inc., Unisys Corp. and IBM support the panel's conclusion that the government should recognize TCP/IP as an alternative to OSI.

But the panel's suggestion that federal agencies be set free to chart their own course using whatever they choose — OSI, TCP/IP or proprietary specifications —was roundly criticized as network anarchy in most of the comments filed with NIST.

Many nations said they have been left with the perception that the U.S. lacks a steadfast policy for interoperability.

Government think tank Mitre Corp. reported that the Government OSI Profile (GOSIP) mandate "is justifiably criticized for attempting to standardize technology not yet available for testing."

But the fact that GOSIP is flawed does not warrant eliminating all government-wide net standards, Mitre emphasized.

The idea of the Feds bailing out on OSI is upsetting to the international aeronautical industry, which has adopted OSI for its future network known as the Aeronautical Telecommunications Network.

Boeing blasted the lack of solid policy direction in the report, calling it a "disservice to the government and industry at large."

The Federal Aviation Administration said the lack of a government policing mechanism to enforce the GOSIP mandate and "the willingness on the part of government engineers and procuring officials to ignore the mandate" has contributed to the slow development of OSI products.

"The report failed to recognize that development of OSI products has been purposefully slowed by some proprietary protocol vendors because it is in their best corporate interest to do so," the FAA added.

Many nations, including the U.K. and New Zealand, said they have been left with the perception that the U.S. lacks a steadfast policy for interoperability. Some observers, including the Canadian government, General Motors Corp. and Northern States Power Co., said the panel strayed from its charter, which was to address the convergence of OSI and TCP/IP.

The FIRMP draft report introduced the idea that government users should form affinity groups based on common interests and work out interoperability arrangements among themselves based on their own criteria. Most of those commenting in government and industry were skeptic, but it drew support from the Defense Department.

Gen. Emmett Paige Jr., assistant secretary of defense, said the Defense Department supported the concept of affinity groups but added that such new ideas needed to be subject to more extended debate.

However, the Defense Department did not welcome the FIRMP report's suggestion that the Office of Management and Budget takes on the role of technology overseer for the government. Air Force Capt. Timothy Frichtel, speaking for himself, said the Department of Defense failed to foster OSI by leaving it out of procurements and letting the Defense Data Network grow up with TCP/IP. He said OSI can work if government users make a true effort to carry out the policy.

Digital

Continued from page 1

State University in Ames, Iowa. "The people that started making the transition to DECnet/OSI got hung up because they couldn't also have Version 6.0."

Dial 400 for savings

Equipment and transmission costs to support links from 24 sites, each 10 miles away, to a central site.		Traditional routers	WANrouter 400
Data communications equipment	**Price**	**Number needed**	
Digital data service (DDS) data service unit/channel service unit	$1,000	24	NA
T-1 CSU	$1,200	NA	1
Transmission service			
DDS local loop	$60/month	24	NA
T-1 local loop	$120/month	NA	1
Interoffice DDS trunk	$2/month per mile	240	NA
Interoffice T-1 trunk	$10/month per mile	NA	10
Premises DDS local loop	$60/month	24	24
Total cost:		**$40,320**	**$19,920**

NA = Not applicable

"That's something we've been looking for because a lot of people have upgraded their operating systems to 6.0 already," said Scott Davis, senior systems programmer at Bechtel Corp.

On the Systems Network Architecture front, Digital will announce SNA connectivity software called OpenVMS SNA Version 2.2.

It is designed for IBM shops that have a smattering of VAX systems needing access to an SNA host.

Version 2.2 can work with OpenVMS 5.5-2, 6.0 and 6.1, and DECnet Phase IV and DECnet/OSI 5.7. Like previous versions, it allows VAX systems to exchange data and documents with IBM systems as Physical Unit 2.0 nodes.

Version 2.2 of OpenVMS SNA supports from 16 to 64 concurrent sessions.

OpenVMS SNA 2.2 nodes attach to the SNA network over a leased or switched synchronous link at speeds from 1.2K to 64K bit/sec.

In addition to IBM's Synchronous Data Link Control data link protocol, OpenVMS SNA supports the Qualified Logical Link Control for connection over X.25 packet nets.

Digital is also expected to ship the WANrouter 400. It sports a channelized T-1 link that allows as many as 24 remote sites — one per 56K or 64K bit/sec channel — to gain access to a corporate backbone over a single T-1 line.

The WANrouter 400 can support two Ethernet interfaces and two channelized T-1 links, and it routes Transmission Control Protocol/Internet Protocol, DECnet and OSI packets. Digital claims it can save users as much as 50% on their yearly telecommunications costs by consolidating traffic onto a single T-1 line (see graphic).

The WANrouter 400 software is downline-loadable from an Ultrix Reduced Instruction Set Computing host.

Mary Ellen Fortier, Digital's DECnet/OSI marketing manager, confirmed that Digital is targeting a May announcement for the new networking software.

Pricing for the new products could not be determined by press time, nor could availability of DECnet/OSI 5.7 and OpenVMS SNA 2.2.

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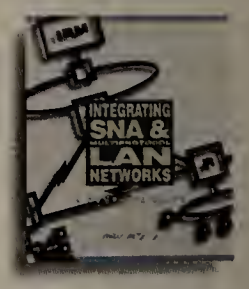
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